May 5, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 61

CHNOLOGY DEPARTMENT

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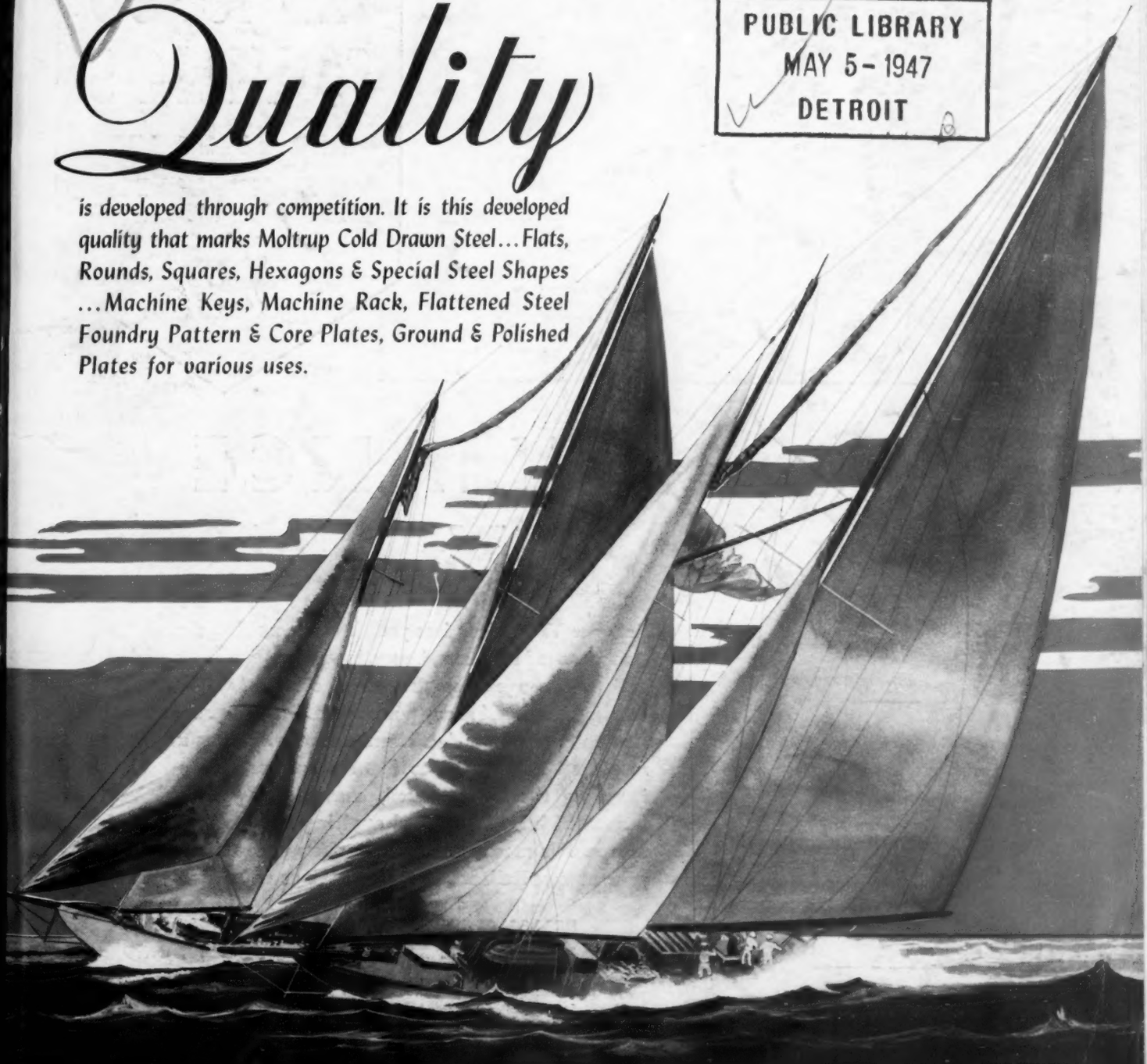
DETROIT

Quality

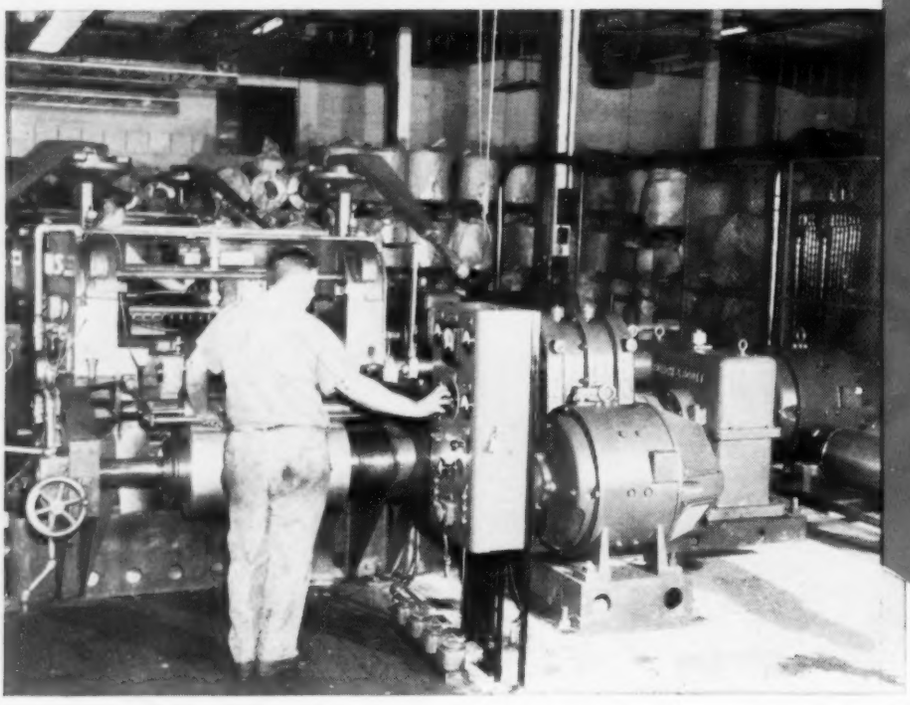
is developed through competition. It is this developed quality that marks Moltrup Cold Drawn Steel... Flats, Rounds, Squares, Hexagons & Special Steel Shapes ...Machine Keys, Machine Rack, Flattened Steel Foundry Pattern & Core Plates, Ground & Polished Plates for various uses.



MOLTRUP
STEEL PRODUCTS COMPANY
BEAVER FALLS, PA.

✓R v.120 pt.3 May-June 1947

ADJUSTABLE SPEEDS FROM A-c. CIRCUITS *Plus* $25 to $60 SAVINGS PER KILOWATT OF INSTALLED D-c. CAPACITY *with*



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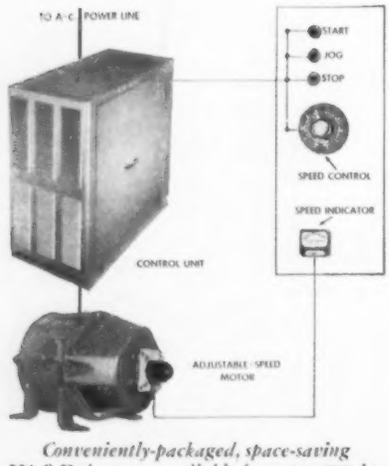
RELIANCE V★S DRIVE



Conveniently-packaged, space-saving V★S Drives are available from 1 to 200 hp.

Reliance V★S Drive gives you all the flexibility of machine operation you need for faster, better, lower-cost processing. This means an infinite range of stepless speed changes, quick, smooth starts and stops, reversal at any point desired and maintenance of proper tension . . . all from A-c. circuits. And with these advantages, you reap the PLUS of $25 to $60 savings per Kilowatt capacity by installing the factory-wired, conveniently-packaged V★S Drive instead of bringing in and applying D-c. power from a central source. For more money-saving facts about the V★S Drive, call your nearest Reliance Representative or write for Bulletin 311-A.

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"Motor-Drive is More Than Power"

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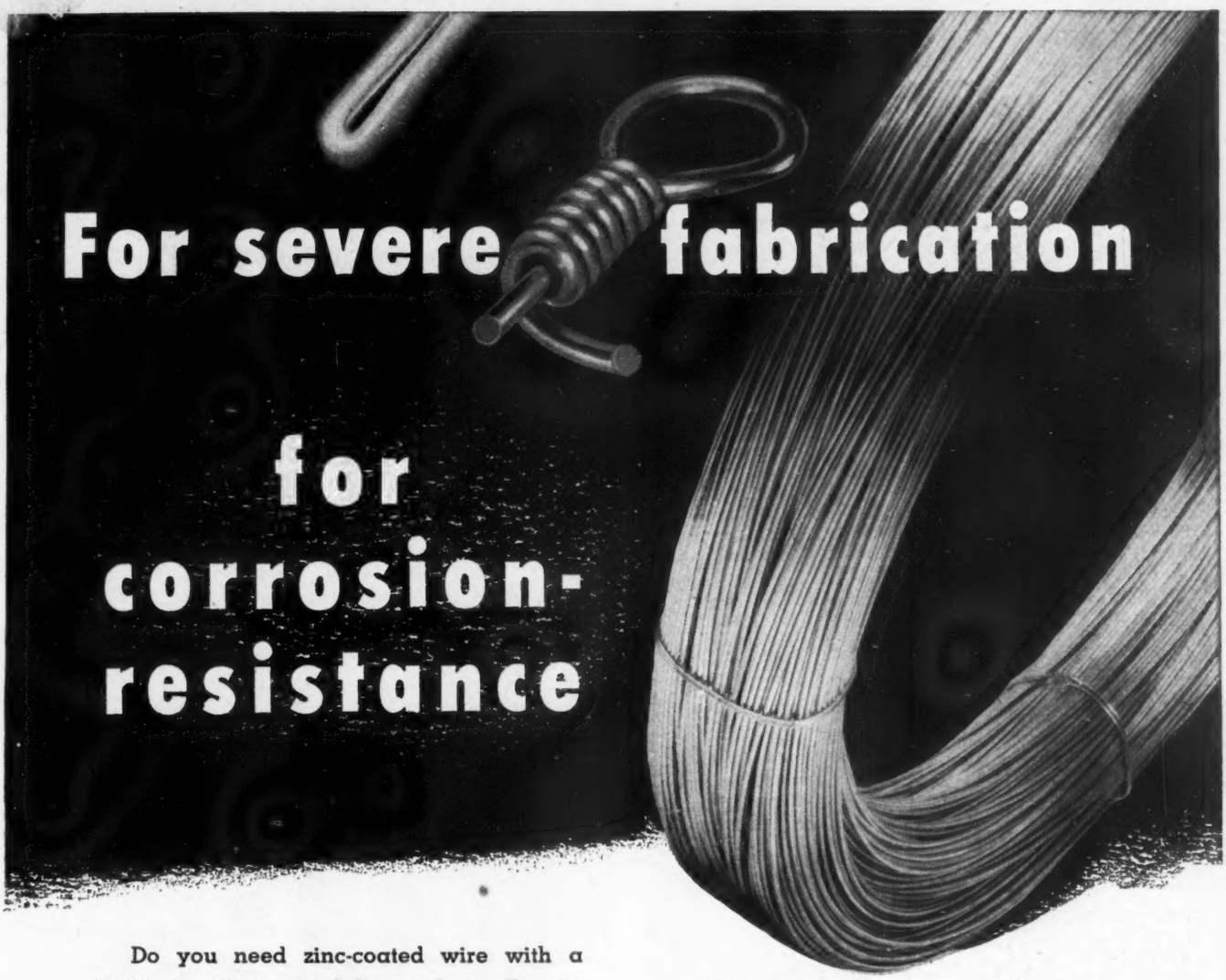
For severe fabrication for corrosion-resistance



Bethanized wire has a ductile coating of pure zinc. It can be bent severely, twisted around its own diameter, even drawn to fine gauge without cracking or peeling of the zinc coating.

Do you need zinc-coated wire with a highly-ductile coating? Or one that will resist severe corrosion? Bethanized wire is the answer to *both* requirements.

Bethanized wire is coated with pure zinc (99.9 pct pure) by an electrolytic process which deposits on the wire a uniform coating to almost any desired thickness. The bond between steel and zinc is so tight that the bethanized coating takes the most difficult forming or fabricating operations without cracking, flaking, or peeling. In fact, bethanized wire can be bent flat on itself, wrapped around its own diameter—even drawn through dies to fine gauge—and the ductile zinc coating remains undamaged.

The bethanized coating locks out corrosion so effectively because of the purity of the zinc and the uniform thickness of the coating both around and along the wire. In addition to providing extra protection in normal service, the bethanized coating is available for exceptionally severe corrosive conditions in weights up to three times as heavy as those called for in conventional Type 3 galvanizing.

Perhaps bethanized wire is the answer to one of your production jobs. Naturally we'll be glad to cooperate in every way possible. There's a Bethlehem district office near you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

★ Bethanized Wire ★ BETHLEHEM STEEL ★

May 5, 1947

One-Man Operated

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ONE MAN

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OPERATED, TRAVELED AND STEERED FROM THE CRANEMAN'S SEAT

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- BALANCED WEIGHT
- SIMPLE, POWERFUL DESIGN
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WITHOUT fatigue, and all day long, *one man*, with an Aero-Crane, does the work of 4 or 5 men—gets your material onto the stockpile and out again at minimum cost. With the Aero-Crane one man handles 200 to 1000 lb. loads that eat up the time of a yard crew.

Designed for rapid yard work, the Aero-Crane goes anywhere a truck can go. You can travel it light or loaded with boom in any position. Tough-built, with anti-friction bearings throughout, electric welded construction, non-burn clutches, Air-controls, Aero-Crane keeps going free of breakdowns—pays for itself in saved man-hours.

Built in a range of eight models. Capacities of 3,500 to 60,000 lbs. at 12 foot radius. Diesel or gasoline powered.

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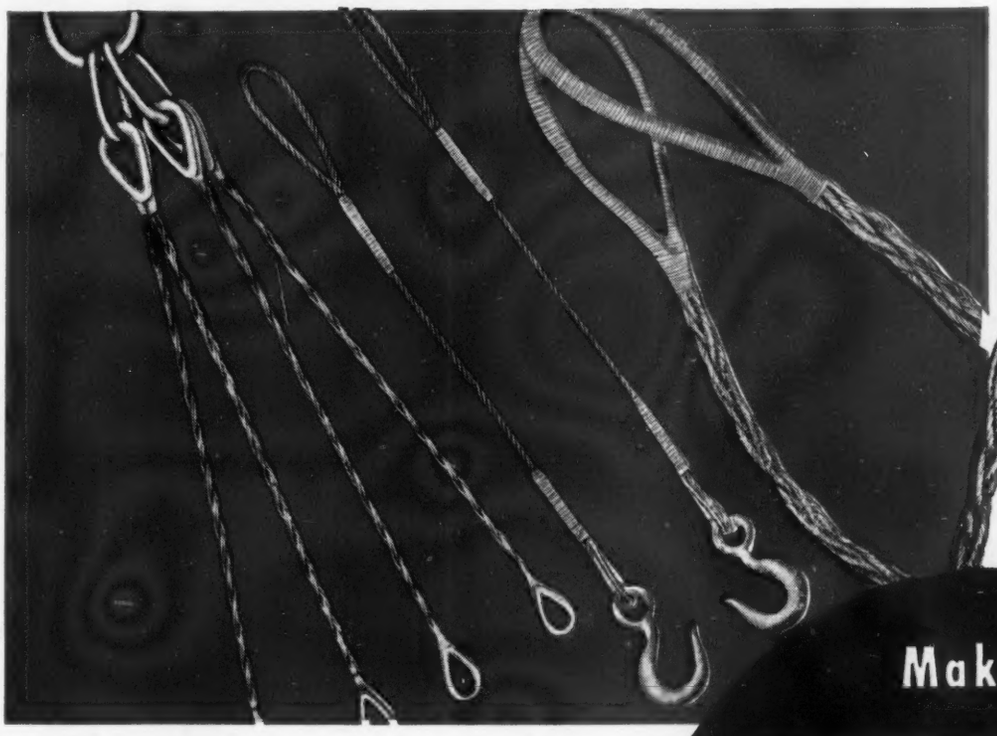

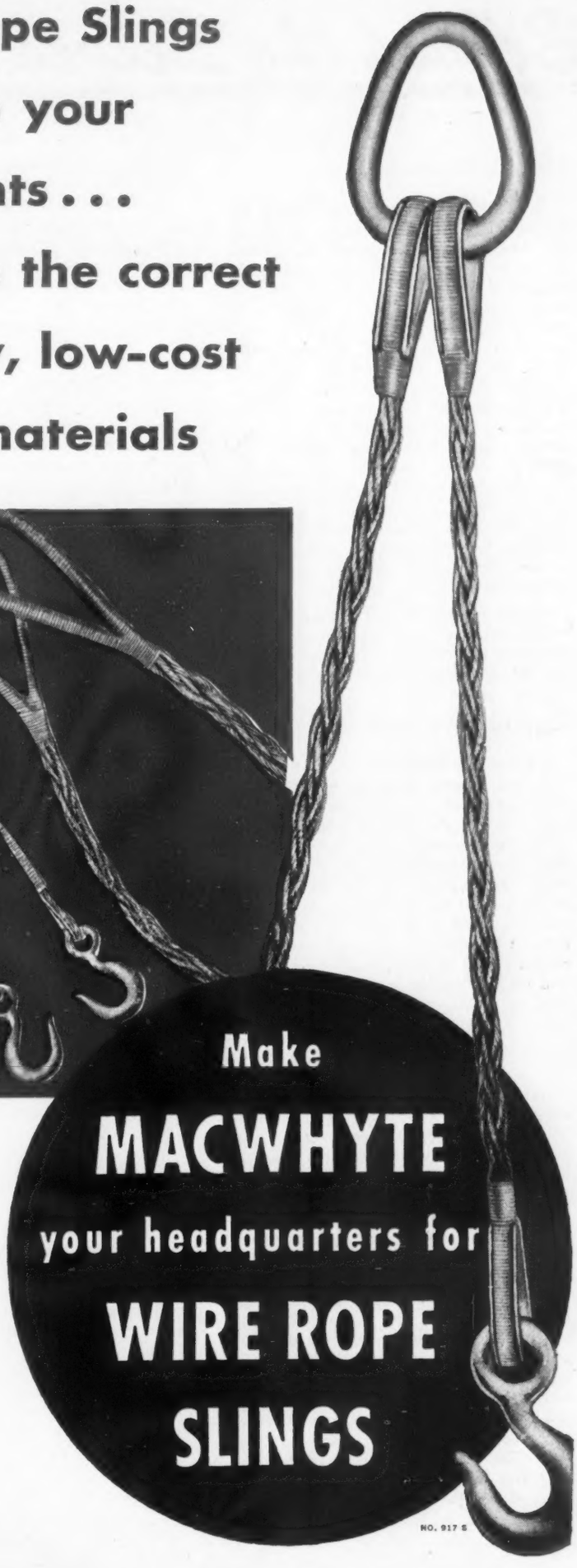

Macwhyte engineering service is available to help design the correct sling for your job. Our sling engineers will give you the benefit of their broad experience in designing hundreds of slings for handling loads similar to yours. Ask your Macwhyte distributor, or write Macwhyte Company.

Macwhyte also makes: MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope . . . Galvanized Wire Rope . . . Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. *Catalog, literature on request.*

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Behind the Scenes...

Shaggy Waggers

The "Postage Stamp" is a small book published by somebody on behalf of letter writing and distributed in various parts of the country by companies specializing in direct mail service. One of these happens to be the company who does this service for us, and they send us copies of the book. Currently the P. S. is busily engaged in collecting "shaggy dog" stories. The latest, which we can't let pass without brief mention, concerns a midget who lived in the days of knighthood. He was so small that instead of a horse, he rode on a large and awful-looking dog. The story is appropriately titled "Knight Mare", and it says that this little fellow never had any trouble getting lodging for a night, because nobody could think of sending a knight out on a dog like that!

Honest, that's what it said. Besides, we spared you a lot of pain—the way they had it written it would have taken this whole column just to repeat it!

They Love Us There

It's been a long time since we have built up enough courage to print the proceedings of the self-admiration society here in the column. However, the other day we received a bouquet from one of our readers in New England which recognizes the job we've been trying to do, so we're going to let you watch us patting our own back while he says. "I admire the way that STEEL has forged ahead of the field by sheer merit and general reader appeal. . . ". Thank you, sir, thank you indeed!

Long Lived Lagos

Some things we print in this here now colyume seem to die hard. The Lagos people, for example, have pretty well blanketed the country and we are still hearing from friends all over about people in that equatorial town who have heard through unnamed sources about American business, and if they can only have a free catalog their friends and the friends of all their friends will come to know about it and send all their business (presumably for free catalogs) to the attention of the so kind firm. Then there was the compressed story which we ran last September (if memory serves us), about the Canadian operation which used a waterfall as a natural air compressor and ran all its machinery for free. That one dies hard too, because only last week we heard from a reader in Australia that a half century ago the same process was in use at the Victoria Mine, and was described in detail by an American business paper of that period. And we're still receiving arguments about the grazing horse problem, the coconut problem, and the age-of-the-parents problem. If you have written us about any of these things, let us say here and now that we've enjoyed your letters. Let's have more of them, and we fully agree with all of you.

Puzzle Corner

Since we have amassed a couple of extra puzzles, here's a dividend for you puzzle fans. We got this out of a book, which also told the answer. If the answer isn't right, we can't prove it, but at least we'll run it week after next to give you a chance to compare. Seems that a lady of fashion gave a dinner party. Besides her husband and herself, there were five other couples. In making up her seating arrangement she seated all the ladies and then started to figure out how to seat the men so that none sat next to his wife. How many different times did she have to do this to get all the different possibilities, without moving any of the gals? Aside—to H. C. Osborne of Racine—your telegram about the grape problem beat Bert by several hours.

Trundle Talks

If you have salesmen call on you or are a salesman yourself we earnestly suggest that you take a couple of minutes right now and drop a note to George T. Trundle, Jr., The Trundle Engineering Co., 1501 Euclid Ave., Cleveland and ask him for the latest copy of Trundle Talks, called "Who Pays The Salesman?" It's a brief little booklet but it certainly strikes a sympathetic note if you've ever had much experience out ringing doorbells.

Copies Available

We learn from the Readers' Service Dept. that we have a few copies of that insert from the April 21 issue covering the financial analysis of the steel industry, RSD says they'll be glad to send you one if you would like it. Just send us a letter and we'll shoot one out. If you thought it was a good job, you might let us know and we'll show your letter to the editors, who are always pleased when one of their projects rings the bell.

Shrdlu

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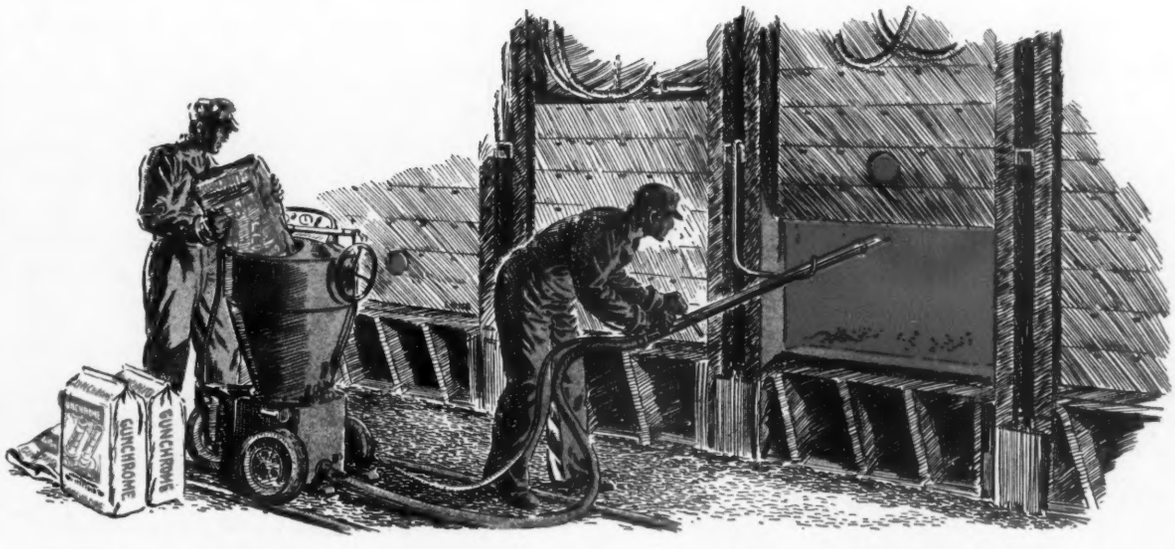
Announcing GUNCHROME

GUNCHROME is a new chrome-base, chemically bonded refractory, designed primarily for mechanical emplacement in the open hearth furnace. It is unique in that it is applied chiefly by airstream —either through the B.R.I. Gun, which has a rate of delivery in excess of 100 lbs. per minute, or with any air gun that is equipped to apply water to the dry refractory at the point of discharge.

Gunchrome is designed for use in the maintenance of open hearth furnace structures such as backwalls, jambs, monkey walls, ports, downtakes, bridge walls, etc.

The new refractory has been tested and approved by representative users in the steel industry. It is now being produced at our Maple Grove plant and is available for prompt shipment to you in any desired quantity.



Basic Refractories Incorporated 845 HANNA BUILDING, CLEVELAND 15, OHIO

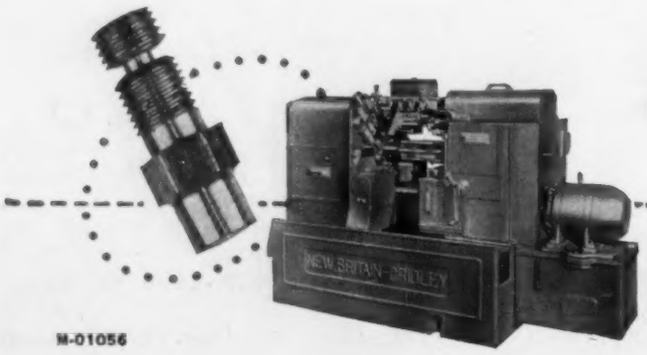
Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

TWO HATS IN THE SAME RING

ENLIGHTENED labor leadership and enlightened management have come to share a vital area of common agreement: That wages come from earnings . . . that earnings come from greater sales . . . that increased sales come from lowered costs . . . that lowered costs come from more efficient production.

Therefore, the new, more efficient machines, better tools, improved methods are the great symbols of our common hope for the future. To management, the duty of providing the means. To hourly rated employees, the duty of making the fullest use of them.

EXAMPLE: A further operation to remove the protruding metal at the center of the head of the piece illustrated would slow down production and increase costs. As the job is produced on a Model 60 New Britain Screw Machine, a rotating pick-off spindle prevents the piece from twisting off before the cut-off tool has finished its travel, leaving the surface smooth to the manufacturer's requirements as the unretouched photo shows. The resulting production rate of 431 finished pieces per hour is a good example of lowering costs without lowering *any* standards, for the benefit of all.



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Automatics

THE NEW BRITAIN MACHINE COMPANY
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One of a Kind

Powerful *Texrope* drive specially engineered for a large mill. This main driver sheave is 7 ft in diameter, has 30 grooves, transmits 1400 hp!

...or One of A THOUSAND!

EVERY TEXROPE DRIVE IS ENGINEERED FOR ITS JOB

YOU GET sound recommendations from Allis-Chalmers — recommendations backed by the greatest V-belt engineering talent and experience in the business.

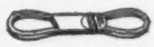
Allis-Chalmers originated the Multiple V-belt drive 22 years ago. Since then, *Texrope* engineers have designed many thousands of drives, ranging from fractional horsepower units for manufacturers of small compressors, pumps or washing machines—to the largest V-belt drives ever installed. They've served: Textile, Mining, Metal working, Petroleum, Chemical . . . in fact, *every* major industry.

Take advantage of this vast research and experience. Bring your V-belt problems to headquarters — for the best in engineering talent — for the most complete line of V-belt equipment made.

Service is as close as your nearest Allis-Chalmers dealer or office. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN. A 2239

Refer to Sweet's Catalog

TEXROPE .. Greatest Name in V-Belt Drives



"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationary or motion control.

SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

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How important that this skeleton be well constructed to withstand sudden impacts, stresses, strains, unusual load demands! Steel, properly designed and erected, is more than a match for any structural demand.

When Ingalls does the job, you can be certain that specifications will be accurately met—assured that erection will be efficient and dependable.

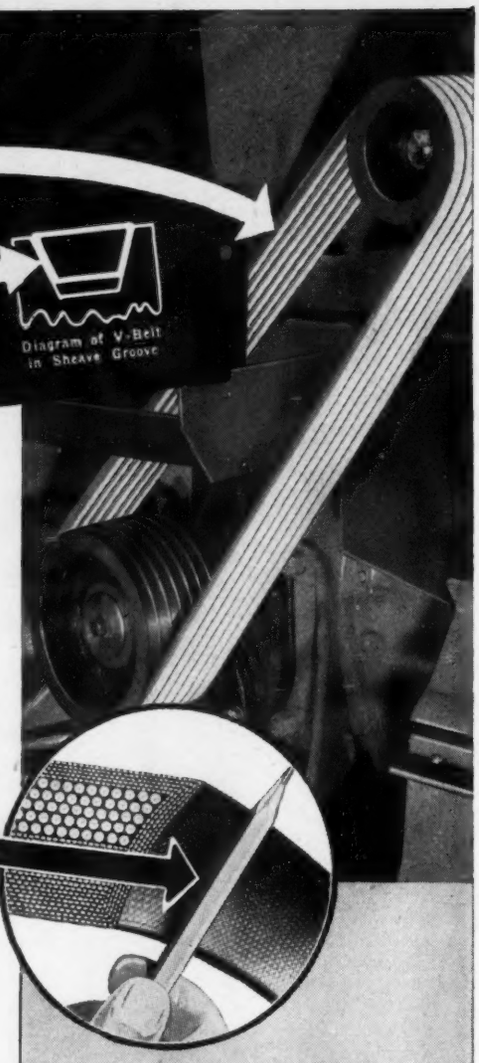
Let us quote on supplying your steel needs, large or small. Complete erection facilities provided, if desired.

INGALLS
STEEL

THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Fabricating plants at Birmingham and Pittsburgh. Shipyards: Pascagoula, Miss., and Decatur, Ala. Offices: BIRMINGHAM, Pittsburgh, New York and New Orleans.

It's the SIDE of a V-Belt

That GRIPS the Pulley
Picks Up the LOAD
and Really Gets the WEAR!



Every ounce of load a V-Belt carries must *first* be picked up by the *sides* of the belt. Clearly so, because *only* the *sides* come into contact with the pulley! The sides do all the *GRIPPING* on the pulley. They get all the wear against the sheave-groove wall. The sides *pick up* the load. They transmit that load to the belt as a whole. And then, once more, the sides —and the sides *alone*—grip the driven pulley and *deliver* the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

That's Why the CONCAVE SIDE is ★ IMPORTANT to YOU!

A GATES PATENT

Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt—and that is why the patented Concave Side is important to you.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Straight Sided V-Belt — Fig. 1

How Straight Sided V-Belt Bulges When Bending Around Its Pulley — Fig. 1-A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall — Fig. 2

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley — Fig. 2-A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

★ More Important NOW That STRONGER Tension Members are Used

Now that Gates *Specialized Research* has resulted in V-Belts having much stronger tension members — tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

THE GATES RUBBER COMPANY Denver, U. S. A.
"World's Largest Maker of V-Belts"

475

GATES VULCO ROPE DRIVES

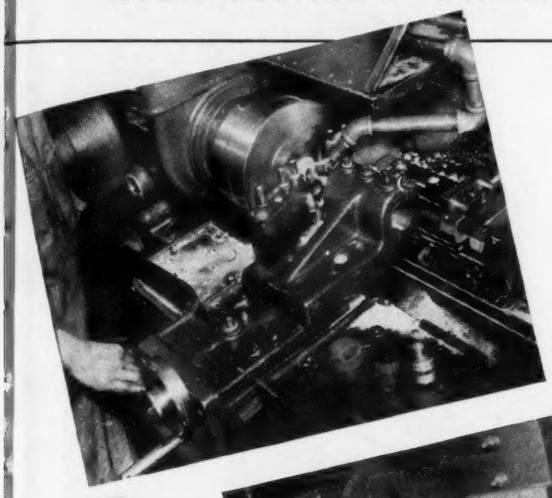
Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

Gates — THE MARK OF SPECIALIZED RESEARCH

3 •• MORE EXAMPLES OF LOW-COST TURNING WITH Multiple Tooling *plus* Automatic Cycling ON Sundstrand AUTOMATIC LATHES

● Whether your turning problem is a mass production job running into thousands of pieces . . . a short run of as few as 25 pieces . . . or a special turning job, Sundstrand engineers will show you how it can be handled to advantage on automatic lathes with quick cycle change-over. They will also assist in designing the most profitable processing method for the job at hand.

All of the advantages of multiple tool turning are available for both short run and mass production work with Sundstrand Lathes. When the nature of the work is such that these standard automatic lathes cannot be tooled to handle the part, our engineers recommend and design special automatic lathes. Described here are three typical cases in which Sundstrand "Engineered" production assisted plant engineers in designing a tooling method which resulted in lower turning costs.

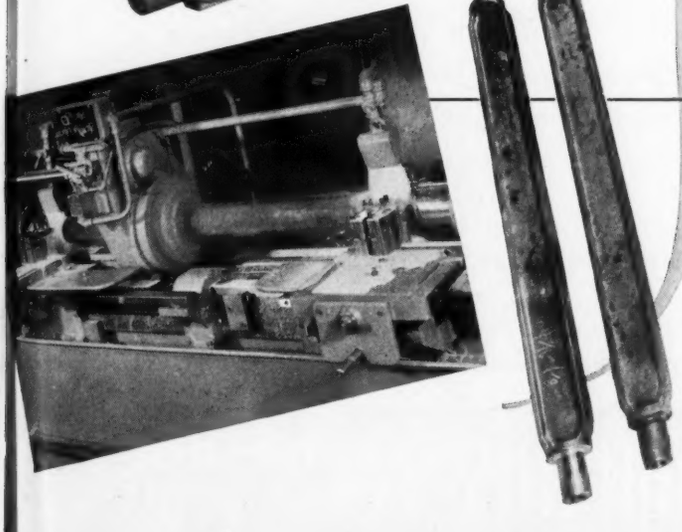


1• SHORT RUN TURNING

This Sundstrand Automatic lathe handles 125 different sizes of gear blanks ranging in size from 1-7/16" O.D. x 5/8" wide to 8-3/16" O.D. to 2" wide. These were formerly machined from bar stock on a chucking machine and finished on an engine lathe. The Sundstrand lathe has reduced total machining time approximately 55% and greater accuracy is obtained. Two different tooling setups are used. The first rough turns the O.D., one face, chamfer and drills hole from solid. The second setup semi-finish turns O.D. one face and chamfer and finish bores and chamfers the hole.

2• LONG RUN TURNING

Here's an excellent example of how Sundstrand Automatic Lathes can be multiple tooled to simplify processing and increase production over other turning equipment. This cast iron pump body part formerly required 3 operations to do the turning, boring, facing and drilling of the center hole at a rate of 9.7 minutes per part. Changing the job to Sundstrand Automatic Lathes with multiple tooling made it possible to do the same machining in 2 handlings of the part and reduced the time per part from 9.7 minutes to 5.9 minutes. In addition to this profitable increase, parts ware consistently duplicated accurately and the operator's duties simplified due to the automatic machine cycle.



3• SPECIAL TURNING

Here's a standard Model 10 lathe with a special bed for handling work up to 66" long between centers. To longitudinal feeding front carriages and two cross feeding rear tool slides are used with a center drive unit so that both ends of the part can be machined simultaneously. Both front and rear slides are adjustable so that, with some additional tooling, approximately 12 different sizes of parts can be accommodated. Production with this lathe and tooling has been increased on an average of five times over the former method. Operations consist of turn, shoulder and chamfer both ends of brake beams.

More FREE Turning Data

This free 44-page booklet contains helpful tips on processing turning jobs, together with illustrations and tooling diagrams. Complete engineering and production data are given on many jobs similar to yours. Write for your free copy today. Ask for bulletin 760.

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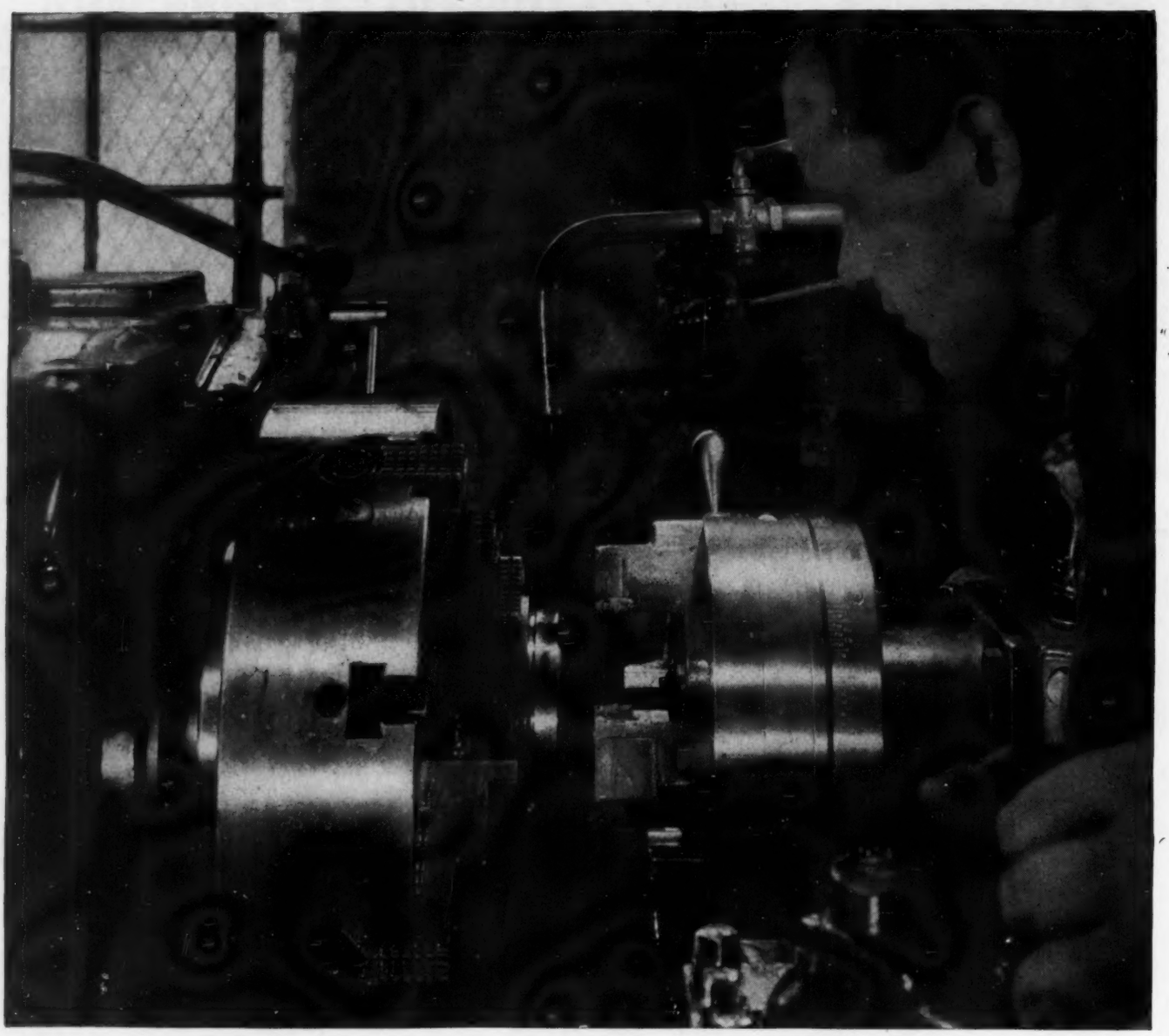


30% Lower Threading Costs with Landmatic Heads

Cost figures show that LANDMATIC HEADS — in thousands of plants — on innumerable types of threading operations — are doing a BETTER — LOWER COST job.

The performance of these Heads in threading Valve Seat Rings for an eastern manufacturer is an example of LANDMATIC HEAD economy. Threads ranging from 1½" to 5" in diameter, 14 and 11½ threads per inch, are cut with Landmatic Heat Treated Heads at an average saving of 30% over methods previously used.

Would you be interested in seeing if substantial economies might likewise be possible in your Turret Lathe operations through use of Landmatic Heads?

Bulletin F-90 will give you detailed information

LANDIS MACHINE COMPANY, WAYNESBORO, PENNA, U.S.A.

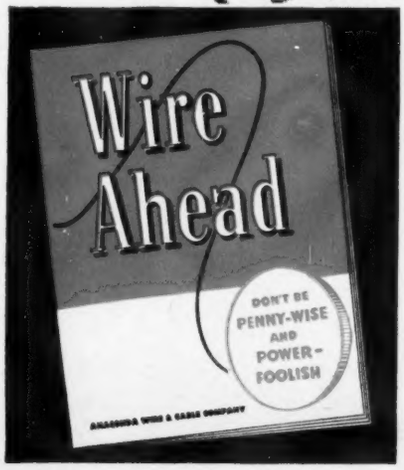
THREAD CUTTING MACHINES • DIE HEADS • COLLAPSIBLE TAPS • THREAD GRINDERS

They just can't carry this load too long!

INADEQUATE WIRING, the industrial jinx, is too heavy a burden for any factory power lines. For, overtaxed, overextended, obsolete wiring can cut operating efficiency 25 to 50 percent.

And, sooner or later, this sinister acrobat causes tie-ups that result in costly shut-downs for extensive alterations.*

Call in your plant power engineer, consulting engineer, electrical contractor or utility power salesman. These are the men who can throw a net over him!



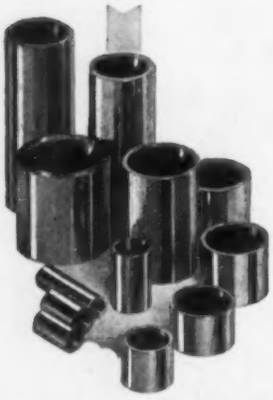
*WIRE AHEAD, a new booklet discussing preventive maintenance ... the symptoms of inadequate wiring ... and presenting plans for anticipating electrical demand, is now in preparation. We shall be glad to send it on request as soon as it is available. Address our Advertising Department, 25 Broadway, New York 4, N. Y.

ANACONDA
from mine to consumer

ANACONDA WIRE AND CABLE COMPANY

JOHNSON BRONZE

ONE STOP SERVICE



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JOHNSON

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Everything

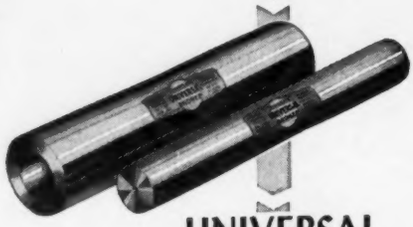
You need in

BEARING BRONZE

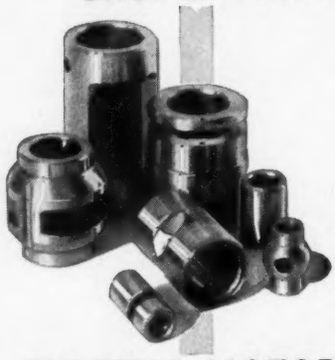
There is a complete Bronze Bearing Service as near as your telephone. Simply look in the classified section of your telephone book . . . under BRONZE. Select the name of your local Johnson Distributor. Then give him a call.

Johnson Distributors can quickly supply you with everything you need in Bearing Bronze. In bars they offer you a range of over 350 sizes. In stock size bronze bearings you can select any of over 850 sizes. Electric Motor bearings come in more then 250 individual types. Babbitt, Ledaloyl, (powder metallurgy) and graphited bronze are all available from *stock*. Every item in the line is the highest quality possible.

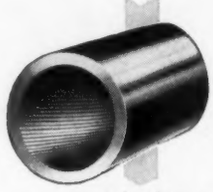
Why not call your local distributor—NOW? Give him the opportunity to demonstrate his exceptional service. The bronze will prove its quality through performance.



UNIVERSAL BRONZE BARS



ELECTRIC MOTOR BEARINGS



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Catalogue

76 pages filled with interesting, informative data—fully illustrated. It's FREE.

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SLEEVE BEARING HEADQUARTERS

The MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD

550 S. MILL STREET NEW CASTLE, PA.

PROTECTION

WHERE NEEDED

H 730-5 . . . Men's Black Kip Blucher Oak Leather Outsole and Slip Sole. Rubber Heel.

Insure Workers Feet In Sure Protection with HY-TEST Safety Shoes

ANCHOR FLANGE STEEL BOX TOE

This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting, tilting, and cutting through outsole under impact.

Catching foul tips is the all-seasons job of Hy-Test's Anchor Flange Steel Box Toes. That's a *big* job in the accident league where serious, costly toe injuries are always popping up. Hy-Test anchors the steel toe under sturdy, pliant leathers for a smoothly patterned safety shoe that feels better, looks better, and wears longer. Sizes are 5 to 15 in widths of AA to EEE. Make it possible for your workers to buy Hy-Test Safety Shoes in your plant. Drop us a card for details.

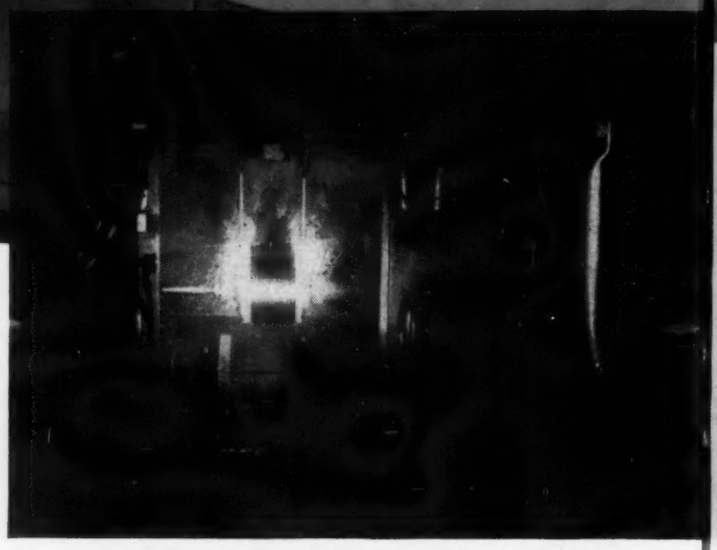
HY-TEST SAFETY SHOES

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST Safety Shoes

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MISSOURI • EASTERN OFFICE • MANCHESTER, N. H.

5 REASONS WHY



This specially designed unit, used for welding end seams on refrigerator-compressor seams, helps hold costs down, quality up.

1. *Greatly Increased Uniformity*—Operator sets controls initially and machine *automatically* assures uniformity and improved quality of deposited weld metal.

2. *Increased Speed*—higher welding currents than can be used with manual welding increase arc-travel speed 10% or more.

3. *Duty Factor Practically 100%*—Machine performs tedious work, largely eliminating operator fatigue and sharply reducing "down" time. Operators can be trained more rapidly too.

4. *Reduced electrode consumption*—Coiled electrodes eliminate stub ends, saving average 17% stub-end loss inherent in manual welding.

5. *FASTER, BETTER PRODUCTION* is the ultimate, overall product of these economies (plus such other advantages as reduced set-up time and easier, more efficient handling.)

● If you have a *repetitive* welding operation, calling for volume production, it will pay you to investigate automatic machine-welding fully. (There are half-a-dozen different automatic welding processes.) Such processes are particularly suited to repetitive welding of relatively simple longitudinal or circular seams on a production-line basis.

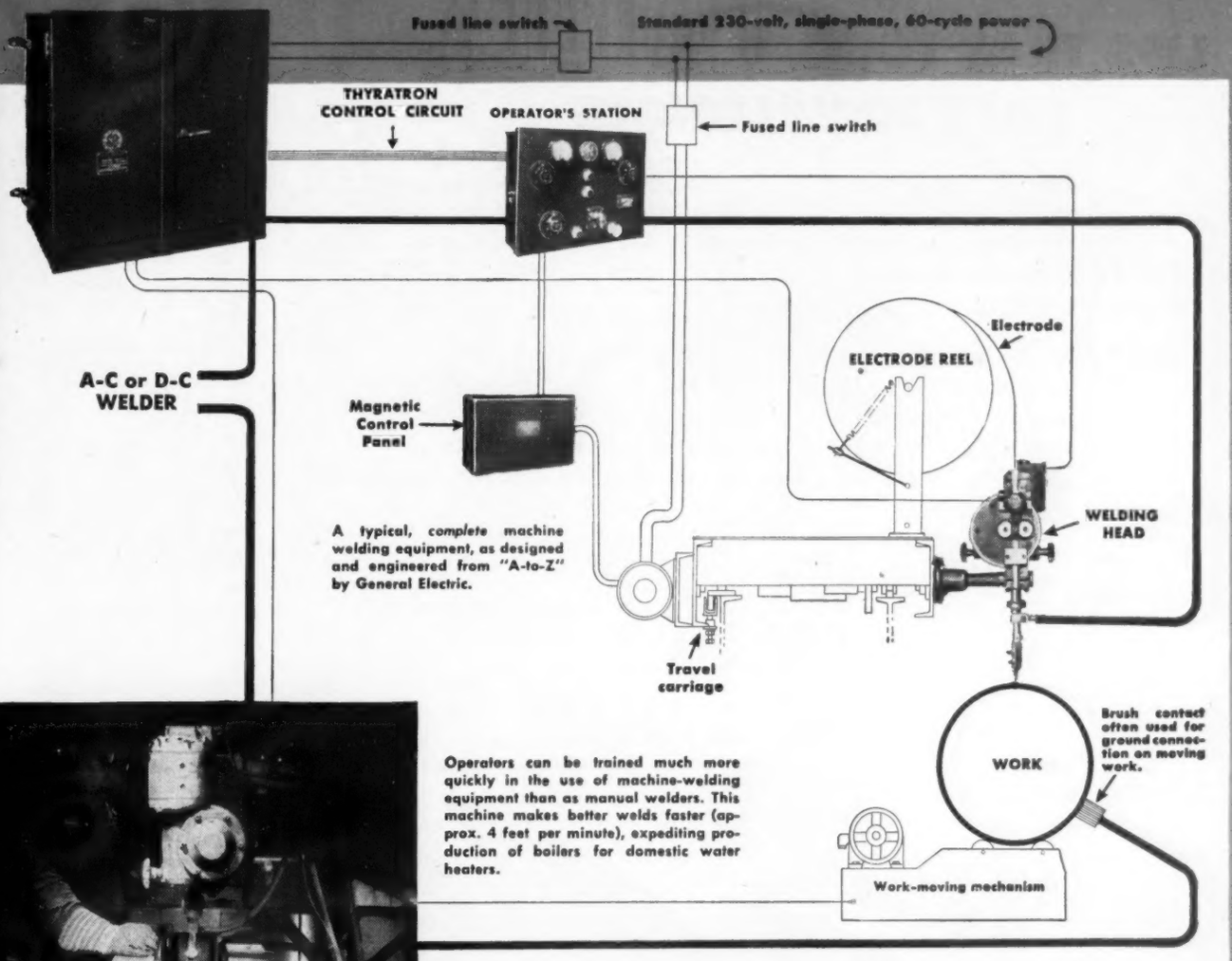
General Electric offers a complete line of machine-welding equipment, including a-c or d-c welders, automatic welding heads*, Thyratron control panels and operator stations, travel carriages, work-moving mechanisms, stick or coil electrodes, and all accessories. Whether your requirements are for a complete, individually engineered equipment, or simply for a welding head, your G-E Arc-welding Distributor will be glad to work with you and supply the necessary equipment, properly engineered and adapted to *your specific* requirements. For information on recent progress in automatic arc welding, write for bulletin GET-1261: *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

* G-E builds five types of automatic welding heads: (1) for Inert-Arc machine welding, (2) for atomic-hydrogen, (3) for metal-arc welding with heavily coated stick electrodes, (4) for metal-arc with heavily coated coiled electrodes, (5) metal-arc with bare or lightly coated electrodes. (No. 5 can be easily adapted for submerged-melt welding—altho G.E. does not supply flux and wire for this process.)

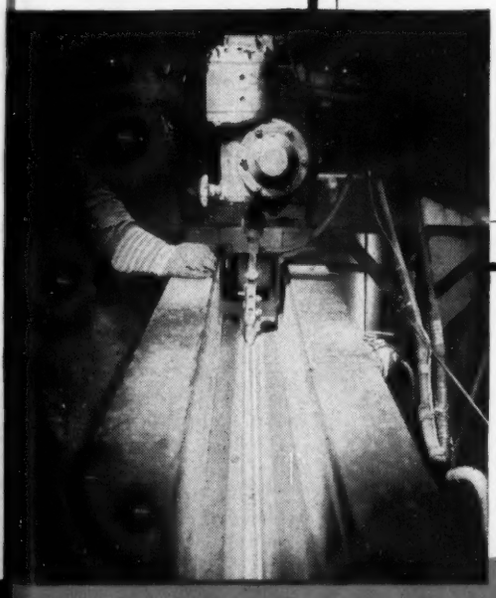
GE ARC-WELDING EQUIPMENT, ELECTRODES AND ACCESSORIES

AUTOMATIC ARC-WELDING

Offers Greater Economy and Uniformity at Increased Welding Speeds



A typical, *complete* machine welding equipment, as designed and engineered from "A-to-Z" by General Electric.



Operators can be trained much more quickly in the use of machine-welding equipment than as manual welders. This machine makes better welds faster (approx. 4 feet per minute), expediting production of boilers for domestic water heaters.

G-E ARC-WELDING DISTRIBUTORS, in principal cities from coast-to-coast, stand ready to service all your arc-welding requirements, be they for machine or manual welding equipment, electrodes, or accessories. They are also equipped to provide helpful "know-how" in solving your welding problems, in which they are backed up by G.E.'s welding laboratories. See, call or write your nearest distributor today!

GENERAL ELECTRIC

DETROIT PUBLIC LIBRARY

LIPS THAT TOUCH HARDEX

LAST 300% LONGER

Lips of clam-shell buckets, hard-surfaced with Hardex Electrodes, have a life span 300% longer than without hard-surfacing, according to a welding superintendent who studied the results of Hardex all-position rods.

What Hardex Hard-surfacing Is

Hardex hard-surfacing is a low cost, yet efficient, method of repairing and renewing used parts and of increasing the effectiveness of new equipment by applying, with special electrodes, a facing, edge or point of hard alloy to iron and steel parts... greatly increasing their resistance to abrasion, impact, heat and corrosion.

Investigate Hardex Electrodes, Too

Hardex Electrodes cover *many* hard-surfacing requirements. Let us help you select the right Hardex electrode to speed production or increase the life of your equipment. Simply write for booklet on Hardex Electrodes.

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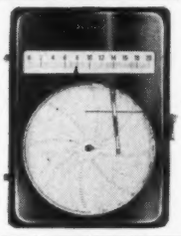
. . on these BRISTOL instruments for the { Metal Industries

A fortunate materials situation has enabled us to build a sufficient stock to offer prompt delivery on these instruments:

PYROMETERS { Recording / Indicating / Automatic Controlling

INDICATING MERCURY-CONTACT PYROMETER CONTROLLERS

Model 478 with low-high contacts in ranges of 0-800°F., I.C.; 0-1100°F., I.C.; 0-1600°F., I.C.; 0-1600°F., 25H; 0-2100°F., 25H; 0-2500°F., 25H; and 0-3000°F., 27. 115v, 60c.

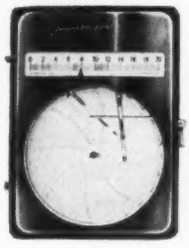


RECORDING PYROMASTER PYROMETERS

Model 431 in ranges of 0-400°F., I.C.; 0-1000°F., I.C.; 0-1600°F., I.C.; 0-1600°F., Chromel-Alumel (25H); 0-2000°F., 25H; and 0-2500°F., 25H. 115v, 60c.

INDICATING ELECTRONIC PYROMETER CONTROLLERS

Model E486 in ranges of 0-1100°F., I.C.; 0-1600°F., I.C.; 0-2500°F., 25H; and 0-3000°F., 27. 115v, 60c.



RECORDING PYROMASTER PYROMETER CONTROLLERS

Model 431-10 with open-high, open-low, or low-high contacts. Range 0-2000°F., 25H. 115v, 60c.

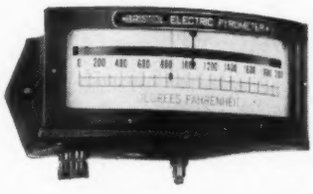
Model 431-20 with low-open-high or low-normal-high contacts. Range 0-1200°F., 25H. 115v, 60c.

Model 431-20 with low-open-high or low-normal-high contacts. Range 0-2000°F., 25H. 115v, 60c.

PORTABLE INDICATING TEST PYROMETER

Model 622 in ranges of 50-800°F., I.C.; 0-1600°F., I.C.; 0-2000°F., 0-2500°F., 25H; and 0-1350°C., 25H.

INDICATING MILLIVOLTMETER PYROMETERS



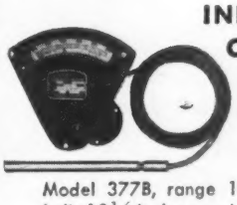
Model 420 in ranges of 0-800°F., I.C.; 0-1600°F., I.C.; 0-2100°F., 25H; 0-2500°F., 25H; and 0-3000°F., 27.

LOW TEMPERATURE CONTROLLERS

Thermometer Type, For Ovens . . . Soft Metal Melting . . . Plating Processes . . . Other Low Temperature Operations.

AIR-OPERATED TEMPERATURE CONTROLLERS

Model 293, range 60-160°F., 10 feet tubing, bulb Sim 0204, tubing and bulb covered with protection of 6% antimony alloy for plating solutions.



INDICATING TEMPERATURE CONTROLLERS (THERMOMETER TYPE)

Model 377B, range 100-600°F., 5, 10 or 15 feet tubing, plain copper bulb 10¼ in. long and 2 ft. flexible extension.

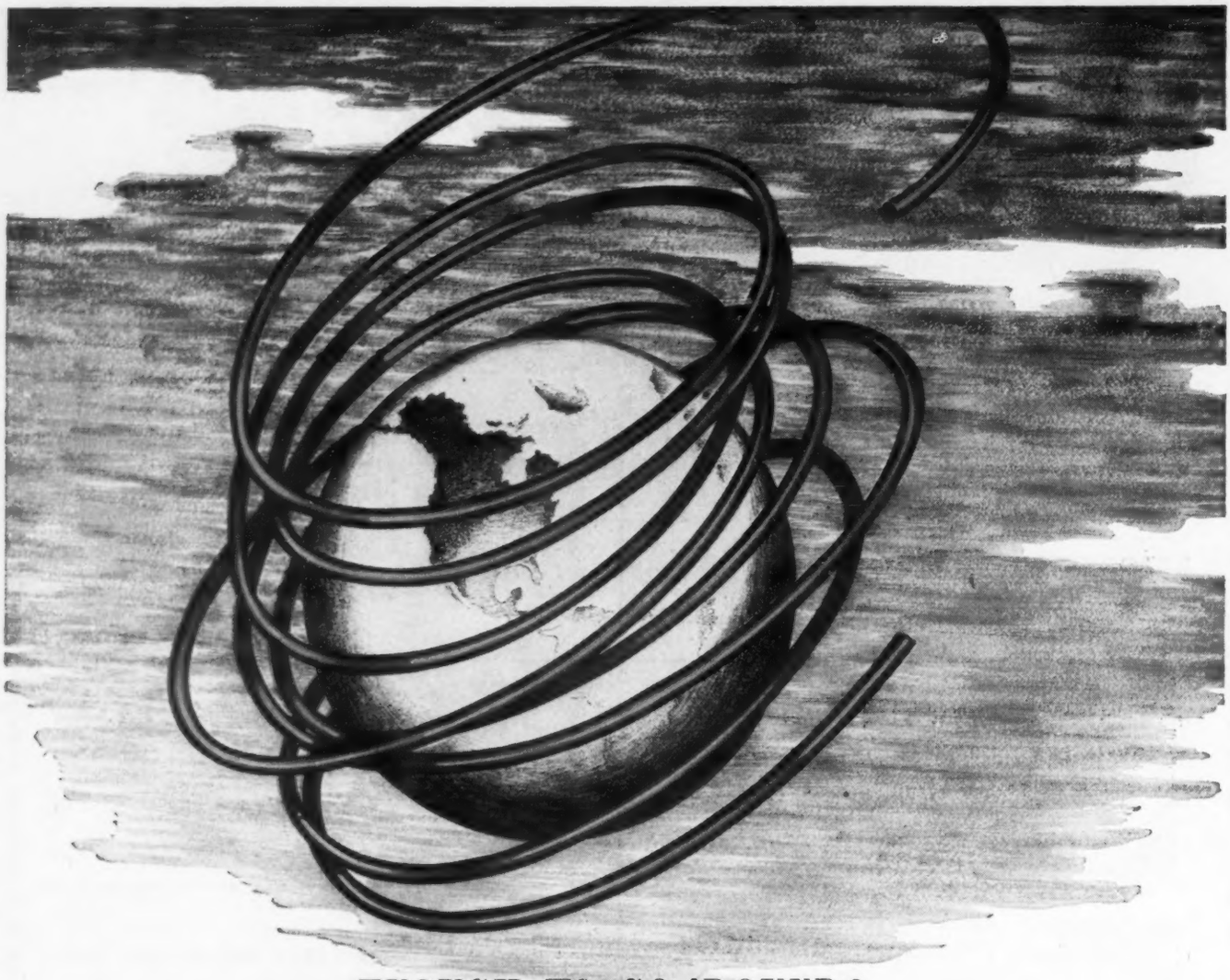
Model 377B, range 100-800°F., 10 or 20 feet tubing, plain steel bulb 10¼ in. long and 2 ft. flexible extension.

Model 377B, range 200-1000°F., 10 feet tubing plain steel bulb in cast iron socket for solder, tin, lead, and babbitt pots. All 115 and 230 v. 60c.

... Gives YOU the Most from Heat

Order from our nearest branch, or direct from: The BRISTOL COMPANY, 105 Bristol Road, Waterbury 91, Conn. (The Bristol Company of Canada, Limited, Toronto, Ontario. Bristol's Instrument Co., Ltd., London N. W. 10, England.)

AUTOMATIC RECORDING AND CONTROLLING INSTRUMENTS



ENOUGH TO GO 'ROUND?

Yes, *figuratively* we produced enough seamless non-ferrous tubing during 1946 to go 'round—enough to go 'round the world 7½ times (1,002,546,887 ft.). But *literally*, we haven't yet caught up with demand. Every day we tell customers "Sorry, we don't know when we'll ship your order". We realize that a few lengths of copper or brass tubing can delay that new refrigerator ordered so long ago, or prevent completion of a new home. Everyone at Wolverine recognizes these responsibilities.

Throughout 1946 our men and machines operated 24 hours each day—six days each week—in order that production might continue its climb. Even with the production records we have attained in the past few months, there is still not enough tubing to go 'round.

A lot of thanks belongs to you who have waited patiently. We sincerely appreciate the confidence you have placed in us, and you can be sure that we will continue to produce as much tubing as possible every day, and still maintain our quality control.

Soon there'll be enough Wolverine copper and brass tubing to go around and we'll be able to fill your needs more promptly.

WOLVERINE TUBE

WOLVERINE TUBE DIVISION

Calumet & Hecla Consolidated Copper Company

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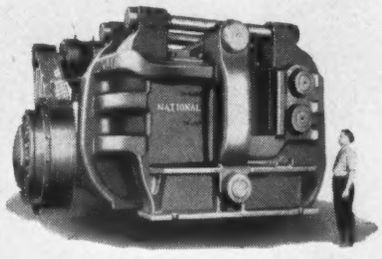
SUPERIOR

This Automotive Universal Joint Housing not only possesses superior physical properties; but, in addition there is vast savings of expensive material and marked increase in production.

The National High Duty Forging Machine, plus National forging technique, can help solve your forging problems.

Investigate!

Above forging developed and produced by
Timken-Detroit Axle Company



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MODERN FORGING MACHINES—MAXIPRESSES—COLD HEADERS—AND BOLT, NUT, RIVET AND WIRE NAIL MACHINERY

New York Detroit Chicago

INDUSTRIAL BATTERIES for Sale

HEAVY DUTY USED STORAGE BATTERIES IMMEDIATELY AVAILABLE ON COMPETITIVE BID

Heavy duty batteries are still hard to get on the open market—but now many are available at WAA offices in:

Special Fixed Price Sale

Some unused batteries are also being offered at low fixed prices. To receive listings, write one of the above offices and ask to be placed on the industrial battery mailing list.

Most of these special purpose batteries are used. They're in serviceable condition and most are adaptable to a variety of jobs where low-voltage or stand-by power is needed. Made by nationally known firms, they're now being offered to enable you to make complete replacements at surprisingly low cost. Write, wire or phone now—or come in yourself to one of the offices indicated, to make sure you get the batteries you need. Also ask to have your name placed on the used battery mailing list.

1109

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GOVERNMENT WAA SURPLUS

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BLUE DEVIL - E 6010

BLUEDAC - E 6011

GRAY DEVIL - E 6012

GRAY DEVIL No. 2 - E 6012

GRAYDAC - E 6013

BLACK DEVIL - E 6020

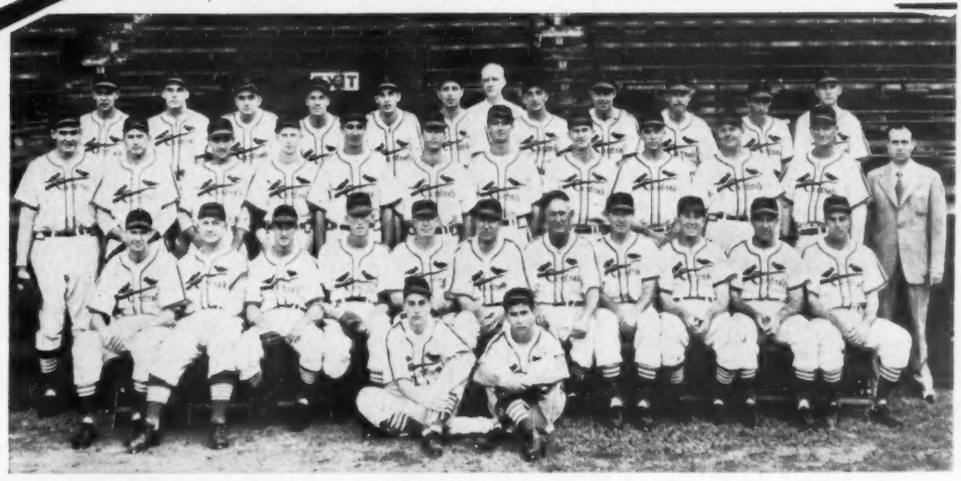
RED DEVIL - E 6030

BLACK DEVIL No. 75 - E 7020

RED DEVIL No. 75 - E 7030

You can expect Star Performance from

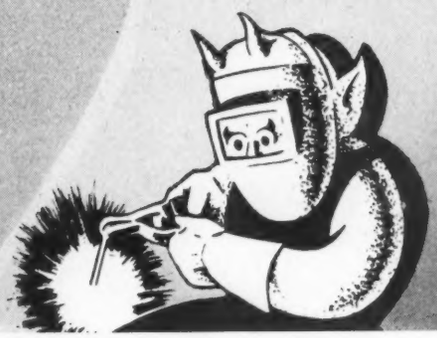
A TEAM OF CHAMPIONS



The 1946 World Series Champions, the St. Louis Cardinals—big league team that had what it takes to come out on top.

A team of *Champion Welding Electrodes*, like a team of champion athletes, is dependable, versatile, rugged and fast. In all positions uniform performance and stamina contribute to that perfect co-ordination which licks the toughest jobs and scores a hit with the customers. For consistently top notch results on your welding problems remember "They Have to be Good to be *CHAMPIONS*."

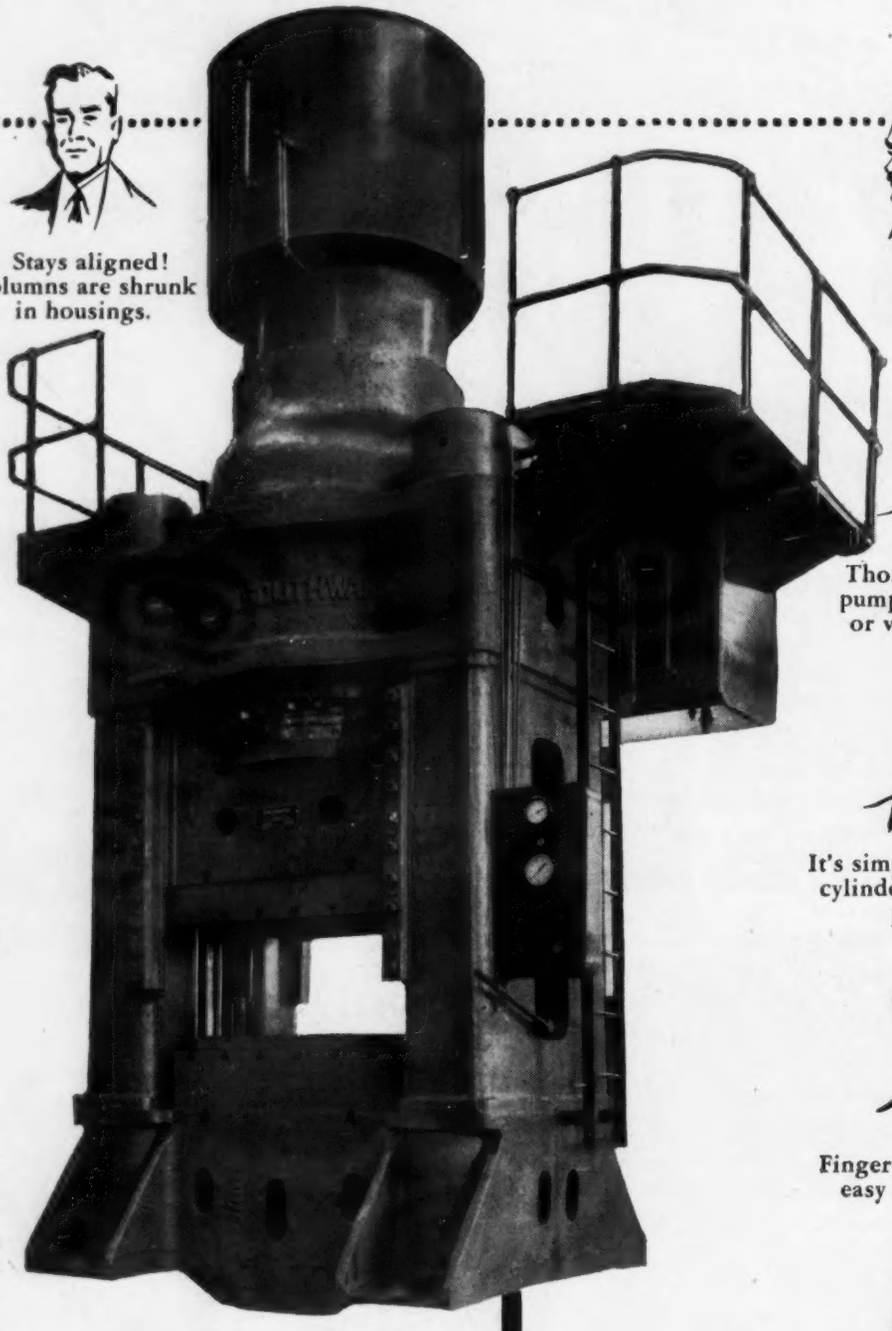
Pierre Champion



THE CHAMPION RIVET COMPANY

CLEVELAND, OHIO — **EAST CHICAGO, IND.**

Everybody's Talking
about BALDWIN HYDRAULIC PRESSES



Stays aligned! Columns are shrunk in housings.

Those high capacity tanks are good . . .

Saves power—main cylinder fills on idle stroke.

It's wear-proofed. Bronze cylinder and gland bushings!

Those die cushions are easy to adapt for stripping!

A dependable name—no risk of "Orphan" equipment.

High Production! That's what we need!

Those radial piston pumps give pressure or volume needed.

It's simple to service—cylinders are outside packed!

Fingertip control—easy to operate.

That hand control handles inching or die setting.

Designed to meet today's production needs, and engineered by one of the oldest and largest press manufacturers, Baldwin Southwark Hydraulic presses have something extra to offer you in the way of appealing features. Experience gained in producing all types of metal presses provides the right answers, right away, to your individual problems. The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Philadelphia, New York, Boston, Norfolk, Birmingham, Houston, St. Louis, Chicago, Cleveland, Detroit, San Francisco, Washington, Pittsburgh, Seattle.

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SOUTHWARK
HYDRAULIC PRESSES

more

gearmotors

in use

today

bear

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MASTER

name

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MORE AND BETTER

Enduro

STAINLESS STEEL BARS

than ever before!

MORE ENDURO Stainless Steel Bars—because of greatly increased facilities. Republic's capacity now is second to none. An entire plant, shown above, is devoted exclusively to the production of cold finished ENDURO Bars and Wire. From now on, you can order these ENDURO products for delivery virtually as desired.

BETTER ENDURO Stainless Steel Bars—because of the addition of the most modern equipment. New furnaces, for instance, that are continuous and automatic in operation with controlled atmosphere available, insure uniform annealing and protection of the fine surface—insure uniform structure and hardness.

Another point to remember: ENDURO Cold Finished Bars are processed by the same management and to the same high standards of quality for which Union Cold Drawn Steels are so well known.

If you use hot rolled or cold finished stainless steel bars or wire, talk to your nearest Republic District Sales Office or ENDURO Stainless Distributor about delivery schedules, or write us. And don't forget that Republic metallurgists and machining engineers are ready to help you get best results from these products.

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MID AMERICA EXPOSITION CLEVELAND

Republic REPUBLIC STEEL

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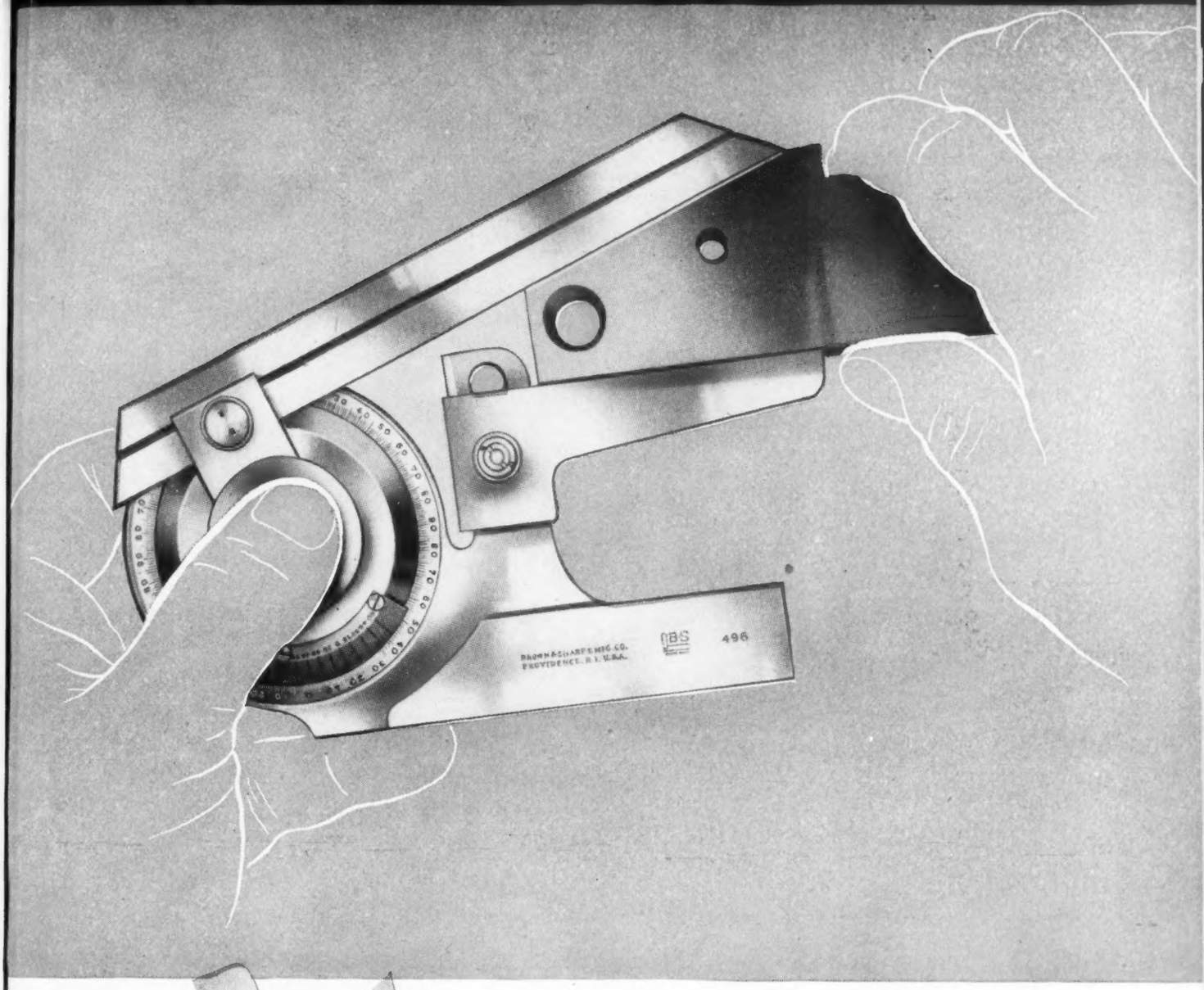
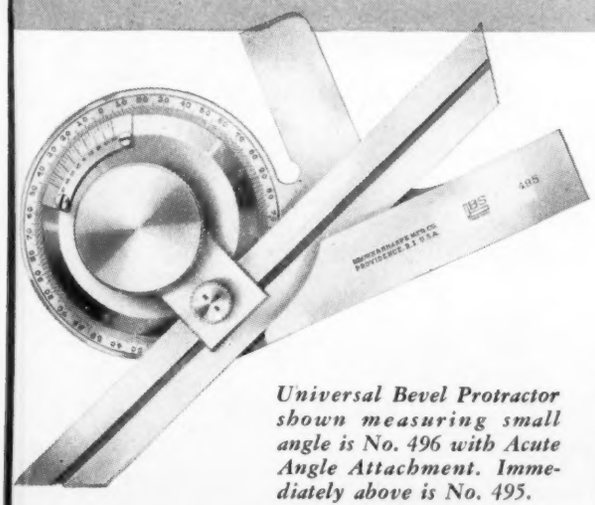
Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

TOOLS THAT EARN THE TRUST

of skilled machinists





Universal Bevel Protractor shown measuring small angle is No. 496 with Acute Angle Attachment. Immediately above is No. 495.

B·S

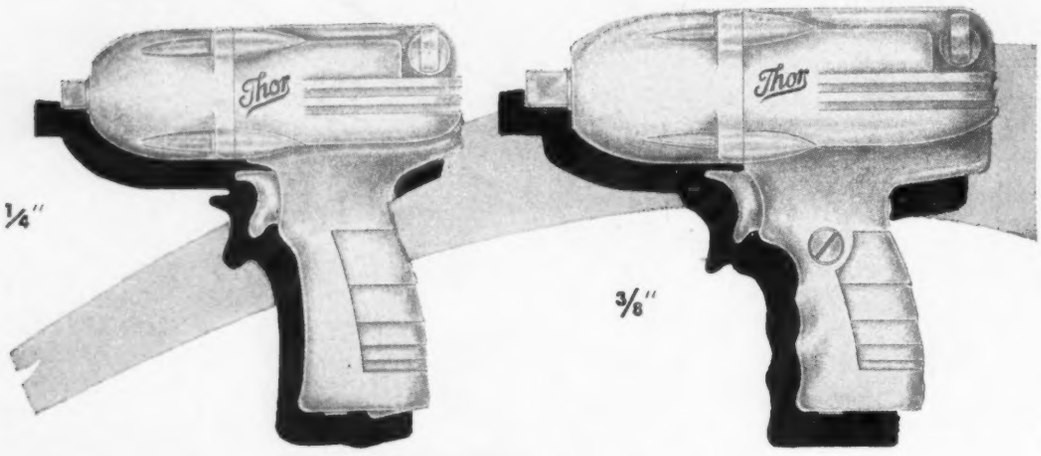
WHEN A MACHINIST lays out or establishes an angle with a Brown & Sharpe Bevel Protractor he has complete trust in the accuracy of a fine tool. That trust, whether inherited from an older craftsman, acquired from everyday use or even from apprenticeship days, has been earned by the superior performance of Brown & Sharpe Tools—by excellence of design and workmanship. This trust is an intangible quality that adds a very tangible extra value to the tools themselves—that makes each purchase of Brown & Sharpe Tools a satisfying, wise investment. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor

BROWN & SHARPE TOOLS

Wherever nuts, bolts and cap screws

These New *Thor*



DRIVE THEM FASTER

REMOVE THEM QUICKER

Harder Blows . . . Greater Torque . . . Less Operator Fatigue

In each of five sizes, this new Thor Reversible Impact Wrench is easily the most powerful tool of its class. Thor's radically new, direct impact mechanism—*an exclusive feature*—hits a *harder, smoother* blow without torque reaction to the operator.

POSITIVE application of pneumatic power to the *short spindle* through an anvil delivers the full impact of every blow—*close to the work.* A Thor Impact Wrench handles the toughest jobs with greater speed.

Thor's amazingly efficient impact mechanism assures longer tool life. Simplified design eliminates many moving parts and contributes to low-cost maintenance.

Call your nearest Thor branch or representative for a demonstration.

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. Jackson Boulevard, Chicago 6, Illinois

Export Division: 300 West 42nd St., New York 18, New York

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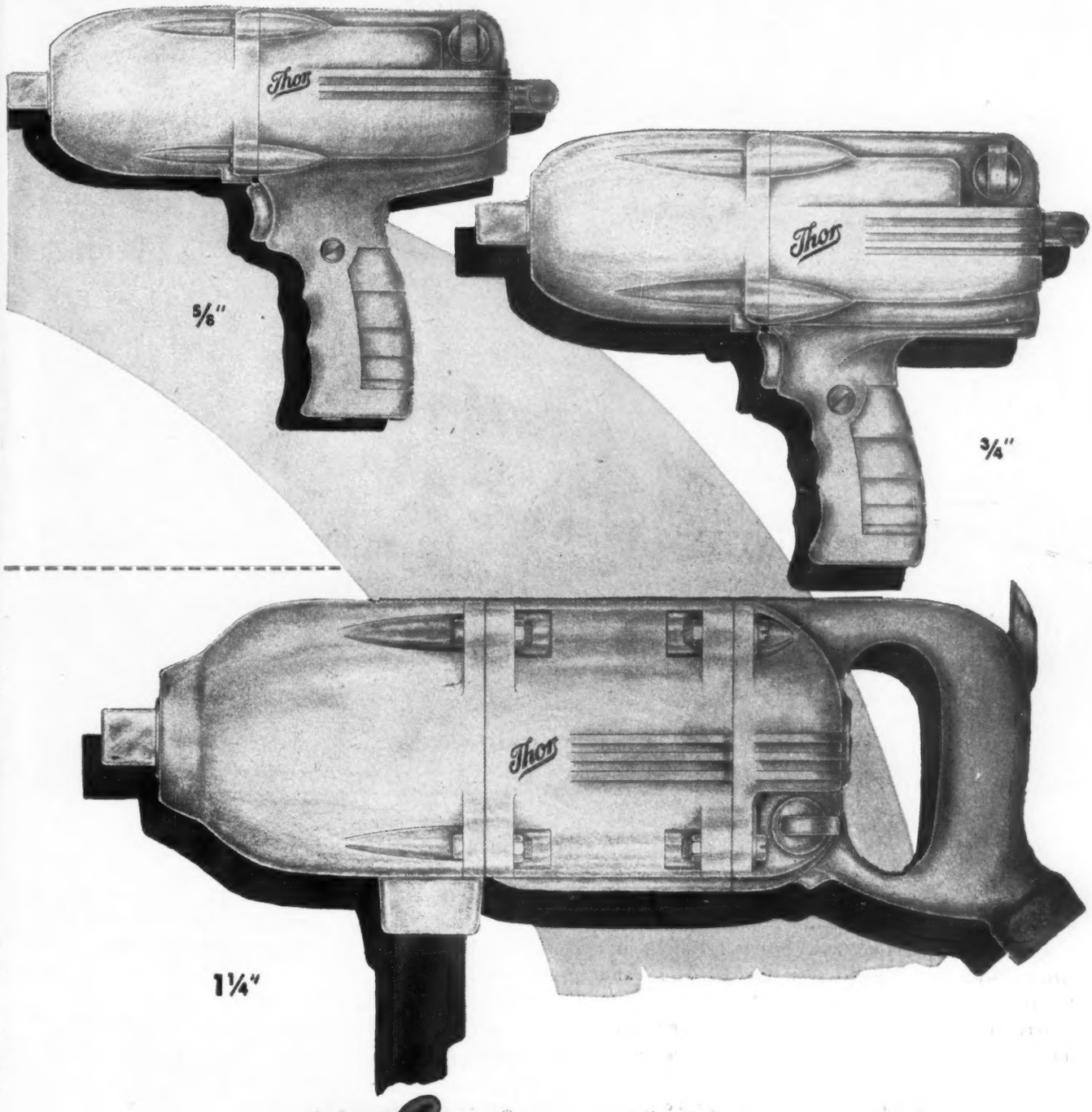
St. Paul	Salt Lake City	San Francisco	Toronto, Canada	Sao Paulo, Brazil	London, England	

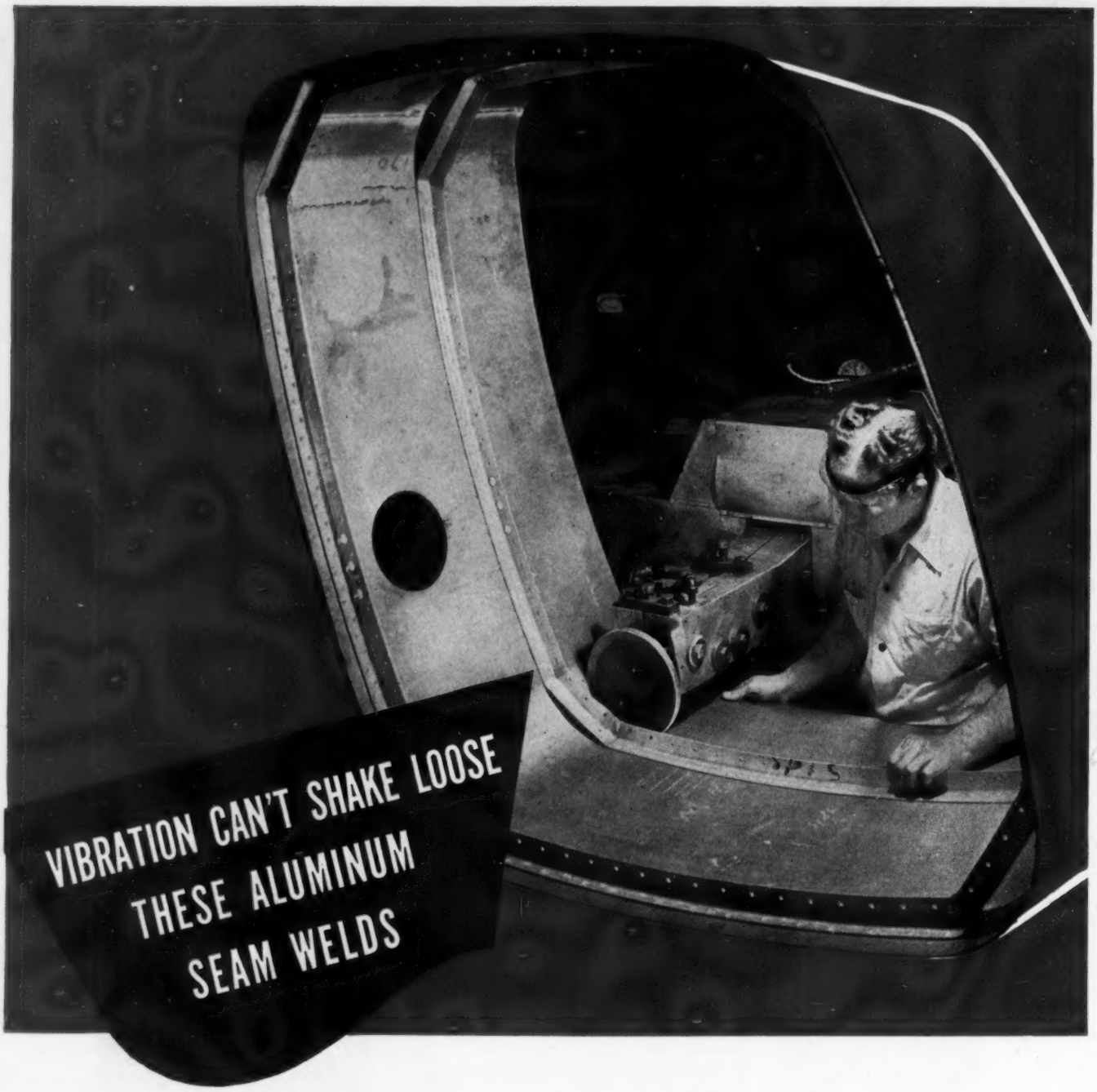
are used . . .

IMPACT WRENCHES



Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS



Electric-resistance seam welding joins the extruded aluminum stiffeners to the aluminum body sheets of this marine gasoline tank. Seams are tight and strong, will stay tight under the vibration and twisting of service in high seas.

Write today for your copy of "Welding and Brazing Alcoa Aluminum". It contains 120 pages of technical information and data that will answer most of your questions. And our technical experts will be glad to help you with any unusual welding problems.

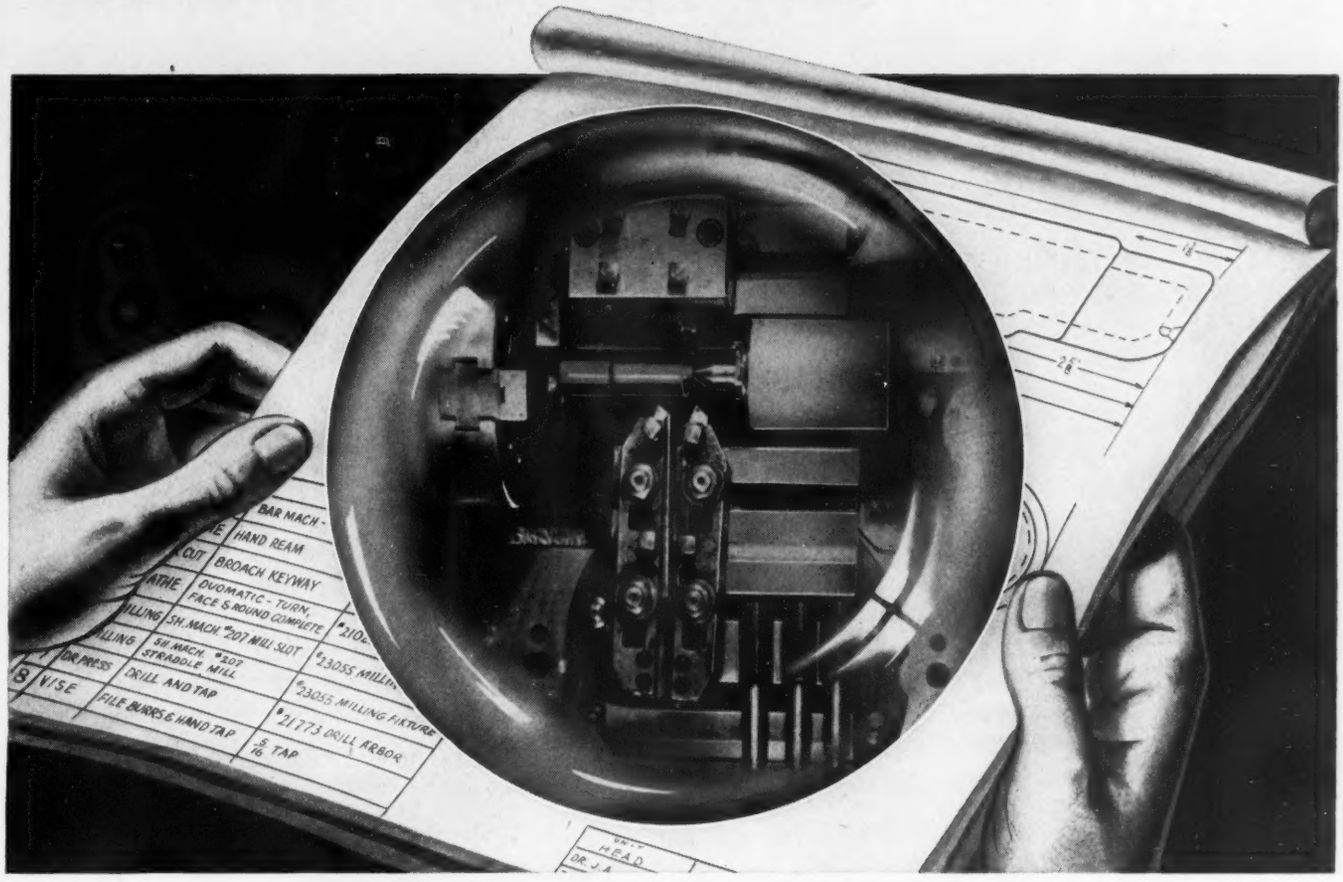
ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN **ALUMINUM**

IN EVERY COMMERCIAL FORM

TURN TO THE FUTURE . . .

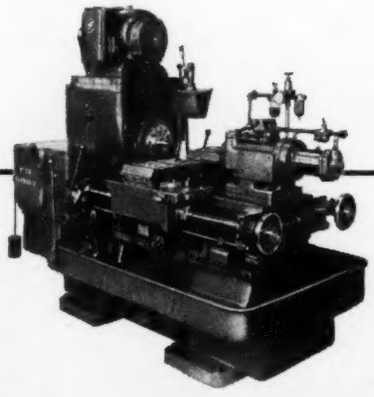


WITH LODGE AND SHIPLEY LATHES

● "It's clear as a crystal . . ." say Lodge & Shipley owners, ". . . Lodge & Shipley Engineering Foresight pays off in a wider range of job possibilities . . . more production . . . more profits!" Authentic production figures back up this statement. In one plant, to set up and run a 500 piece shaft job took 55 hours. The same job was set up and run on a Lodge & Shipley 2A-Duomatic (automatic lathe) in just 18 hours . . . almost 70% savings!

Features built into every Lodge & Shipley Lathe, permit the widest possible use . . . the greatest possible profit . . . are major weapons in cutting competitive costs.

Plan now . . . let a Lodge & Shipley Engineer project the profit possibilities of your present equipment against rising operating costs. Write for Bulletins 634 and 635 on 2A and 3A Duomatic Lathes.



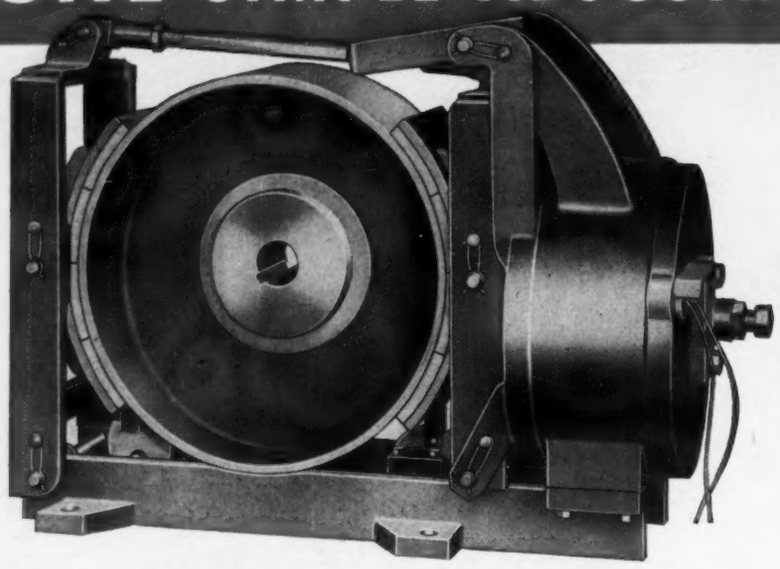
THE Lodge & Shipley COMPANY

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION • 3055 COLERAIN

SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

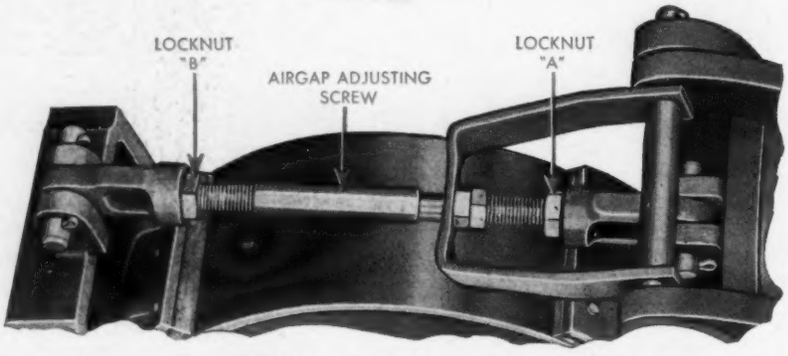
ONLY ONE SIMPLE ADJUSTMENT!



"3C" BULLETIN 106 DC SHOE BRAKE

There's only ONE maintenance adjustment—that's for lining wear. You can see at a glance—DURING OPERATION, OR WHEN THE BRAKE IS IDLE—when lining wear makes adjustment necessary.

Just look at the TOP of the brake—not at the bottom, not at the ends, not at the sides—but on TOP where there's nothing to interfere with examination or correction.



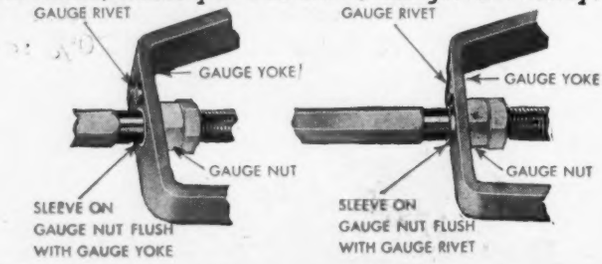
Top view—showing visibility and ease of adjustments

When the sleeve on the gauge unit is flush with the gauge yoke, it means that the lining wear calls for adjustment.

So you loosen locknuts A and B (see picture above). Then you turn the adjusting screw until the gauge nut sleeve is again flush with the gauge rivet (see picture at right). Then tighten locknuts A and B.

That's all! This simple, easy adjustment automatically corrects the Magnet Air Gap and maintains proper shoe clearance.

Shoes cannot tip—shoe drag is automatically eliminated by means of a simple, tamper-proof, patented device. And the entire adjustment is up on TOP of the brake, where you can see it, and get at it easily.



Our nearest District Office or Agency will gladly give you full details. Ask for Descriptive Bulletin 106.

THE CLARK CONTROLLER CO.

EVERYTHING UNDER CONTROL • 1146 EAST 152nd STREET, CLEVELAND 10, OHIO

"pretty as a picture"

the way you can lithograph, enamel and lacquer

Products made from Weirite Electrolytic Tin Plate have plenty of eye-appeal on the nation's counters. Its uniform, fine-texture surface is well suited to all kinds of colorful merchandising dress.

Recommended for dry-packed containers—for cannisters, closures and light toys . . . Weirite Electrolytic Tin Plate is the most economical form of rustproof metal you can use.

Other Weirton tin mill products are Weirite Hot-Dip Tin Plate for liquids and foodstuffs requiring high corrosion-resistance, and Weirite Tin Mill Black Plate.

WEIRITE

Electrolytic Tin Plate

WEIRTON STEEL COMPANY

WEIRTON, W. VA. *Sales Offices in Principal Cities. Division of* NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

IBM EQUIPMENT

The Automatic Accounting Method

FOR ALL BUSINESSES

IBM Electric Punched Card Accounting Machines enable many business organizations to reduce their accounting tasks to a minimum. These machines also lessen the possibility of error encountered in copying or transcribing statistical data, and save valuable time in compiling pertinent facts.

Through the use of IBM punched cards, business firms obtain detailed Inventory Reports, Cost Analyses, and Payroll Reports automatically, quickly and accurately. Information on Sales and Costs Records, as well as on Income Tax Figures, can also be supplied promptly and efficiently.

An IBM installation, either in your office or in an IBM Service Bureau, can handle practically any type of business accounting problem. These IBM Service Bureaus, equipped with all necessary Electric Punched Card Accounting Machines and manned by skilled personnel, are conveniently located in principal cities.

IBM

ELECTRIC PUNCHED CARD ACCOUNTING MACHINES

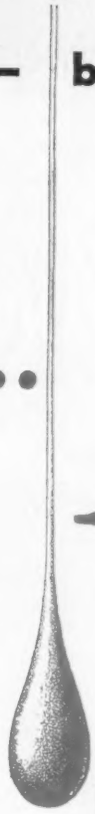
ELECTRIC TYPEWRITERS • • • PROOF MACHINES • • •

TIME RECORDERS AND ELECTRIC TIME SYSTEMS

International Business Machines Corporation, World Headquarters Building, 590 Madison Avenue, New York 22, N. Y.

4 short words— but they mean a lot to you!

Less oil... Less often...



Houghton's fortified lubricants live up to that promise, because:

First, the treatment given them enables a wider range of application per grade. That means less varieties needed, a fact proven in plant after plant. Then, too, these lubricants are scientifically treated to require less oil per application. Consumption and oiling time are reduced.

And finally, they are recommended only after careful study of a plant's individual needs, checking with you to combine your experience with that of the Houghton Man.

Whether your problem involves high temperature lubrication, excessive wear, water resistance, elimination of gums or sludges, excessive inventories, or the simplest item on your program—Houghton can help you. E. F. Houghton & Co., 303 W. Lehigh Ave., Phila. 33, Pa. Sales and service in all principal cities.

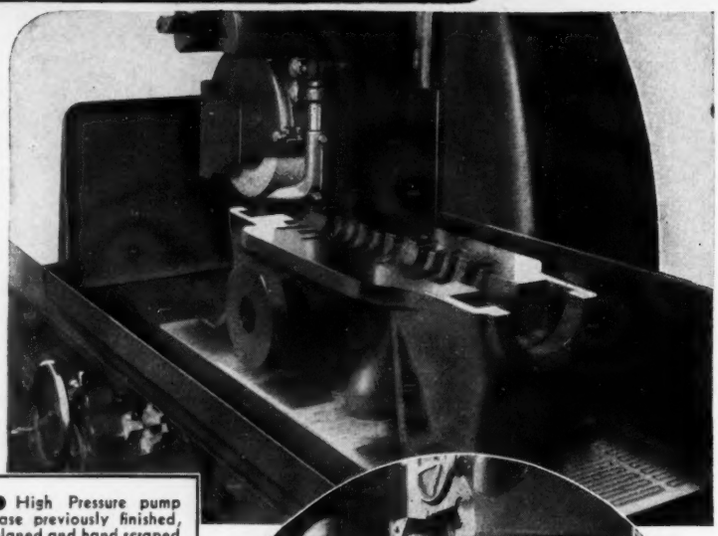
Houghton also offers the metal industry:

CUTTING OILS ★ QUENCHING OILS ★ HYDRAULIC OILS
RUST PREVENTIVES ★ HEAT TREATING SALTS
DRAWING COMPOUNDS ★ CARBURIZERS

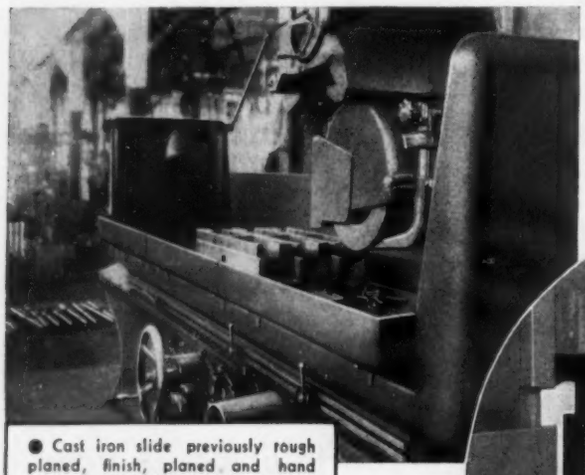
MATTISON GRINDER
Cuts time up to 75%
ON JOBS PREVIOUSLY HAND SCRAPED

Examples: Time on pump case reduced from 40 hours to 4 hours . . . . . Time cut from 12 hours to 3½ hours on slide castings . . . . . Yearly saving on Housings — 22% the cost of machine, etc.

When added together, time savings like this make a big difference in manufacturing cost. To see what Mattison High-Powered, Precision Surface Grinders can do on your work, send us blue prints for production estimates.

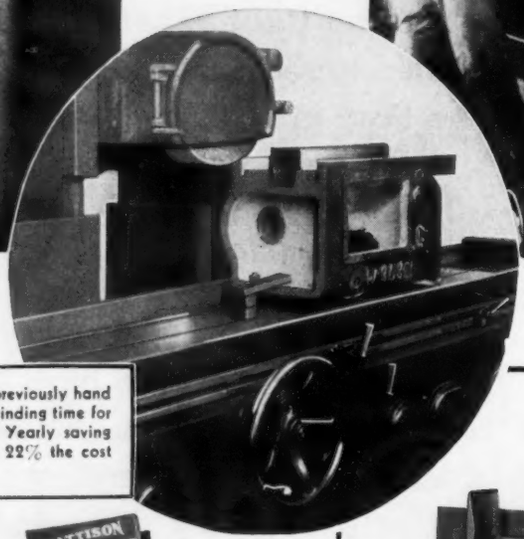


● High Pressure pump case previously finished, planed and hand scraped in from 40 to 48 hours — Now the Mattison Grinder has made these operations unnecessary, reduced time to 4 hours and case comes through with a fine finish and accurate to within .0003".



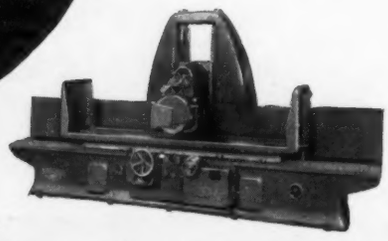
● Cast iron slide previously rough planed, finish, planed and hand scraped — NOW GROUND on Mattison Grinder (6 pieces per set-up) at an 80% savings in time. Finish planing and scraping operations eliminated.

● Cast iron frame previously hand scraped, NOW GROUND top and bottom of casting, shoulder and inside surfaces. 75% time saving.



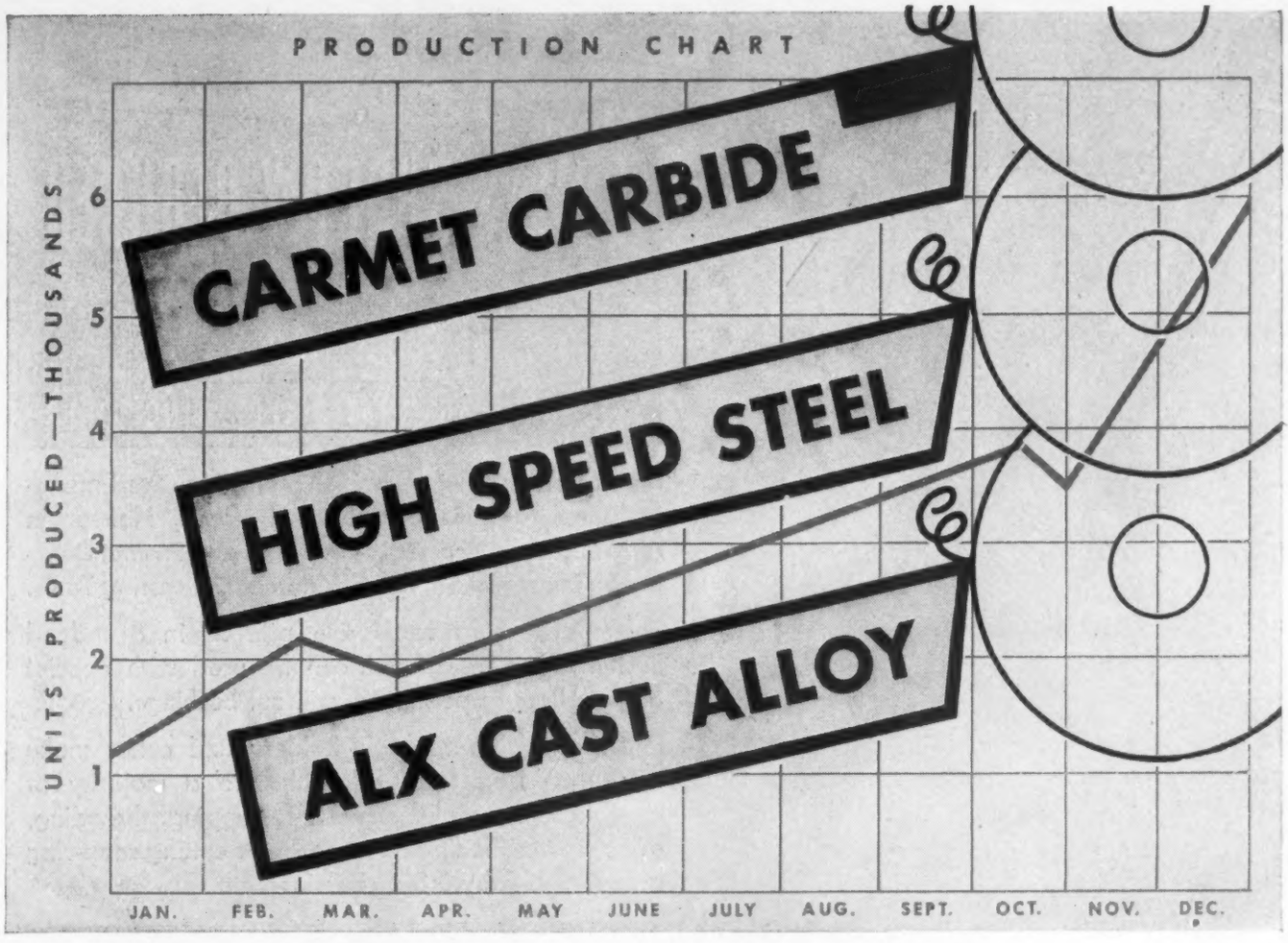
● Cast iron Housing previously hand scraped in 8 hours. Grinding time for housing is 2.5 hours. Yearly saving on this job alone was 22% the cost of machine.

Write for Free Set-up Book containing further examples, showing how others have reduced time and cut costs with Mattison Grinders.



Mattison High Powered Precision Surface Grinder. Table Sizes: 12" to 36" wide, 36" to 192" long.

MATTISON MACHINE WORKS
ROCKFORD · ILLINOIS



Which CUTTING TOOL MATERIAL WILL DO *Each* OF YOUR JOBS *Best?*

Allegheny Ludlum offers you—*from one source*—a choice of *every* type of cutting material . . . each in a wide and complete range of grades and sizes. That means a better opportunity for you to pick the tools *best* suited to each of your production jobs—with resultant savings in production time and costs. There's real value for you in one source for all your cutting tool requirements, plus a competent Mill Service Staff to assist your selection. • Write today—on your company letterhead, please—for our new, full-color booklet on "Cutting Tool Materials." You'll find it a big help in your production plans.

SEND FOR THIS NEW BOOK

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STEEL CORPORATION • Pittsburgh, Pa.

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Fine Tool Steels Since 1854

W&D 994

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always RIGHT in the groove FOR PRECISION RECESSING, GROOVING, UNDERCUTTING AND FACING

PRICES SHARPLY REDUCED

ON IMPROVED

SCULLY-JONES

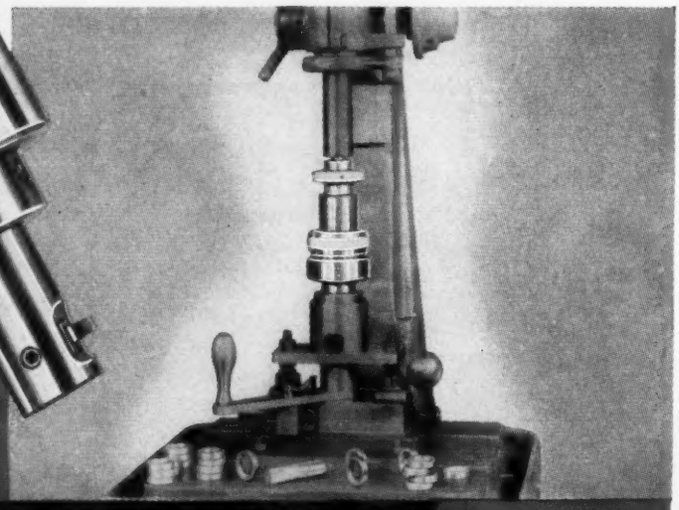
STANDARD AUTOMATIC RECESSING TOOLS

New engineering developments and improved manufacturing facilities enable Scully-Jones, Pioneer in recessing tools, to offer Lower Prices and Prompt Delivery on improved Standard Automatic Recessing Tools.

These recessing tools are piloted in Standard Bushings but, if desired, can be used with Special Stop Collars to permit use without bushings.

Interchangeable tool bit holders and cutter make these recessing tools adaptable to a majority of operations for making reliefs in tapping, threading, grinding and honing operations; for cutting snap-ring grooves, oil labyrinths, chamfers, etc.

If you will send blue prints or describe your recessing problem, our Engineers will gladly suggest the solution.



Refer to the Scully-Jones Catalog showing over 500 types and sizes of cutting tools, collet chucks, boring equipment, centers, etc.

Size "C" Recessing Tool with No. 8 Cutter, for making single recess in 1" collar, operating in a drill press equipped with modified universal jig vise.

Scully-Jones AND COMPANY

1912 SOUTH ROCKWELL STREET, CHICAGO 8, U. S. A.

IMPORTANT DISCOUNT NOTICE

75% of our Standard Tool Prices have been reduced. Write for new discount sheet.

SIZE "J"—SIZE "C" REDUCED 50% CUTTERS EXTRA

PROMPT DELIVERY . . . WRITE FOR DETAILED LITERATURE

Here is the low-cost, motor-driven gas cutting machine you are looking for—the Airco No. 10 Radiagraph.

This machine cuts straight lines of any desired length in steel plate . . . arcs up to 42½ inch radius . . . and circles from 3 to 85 inches in diameter. Further it will prepare edges for welding with a straight butt edge, "V" groove, single or double "U" groove, single or double "J" groove, or double bevel groove without land . . . and it operates at speeds from 4 inches to 50 inches per minute.

Weighing only 41 pounds net, the No. 10 Radiagraph can be easily moved from job to job. To facilitate carrying, the machine has a hand grip on one end.

With this compact, nominally priced machine all shops engaged in preparing steel for welded fabrication can now enjoy the speed and economy of machine gas cutting.

For a copy of a booklet containing full details about the Airco No. 10 Radiagraph, write for ADC-614C. Address your nearest Airco office or Dept. S—5867, Air Reduction, General Offices, 60 E. 42nd St., New York 17, N. Y.; in Texas: Magnolia Airco Gas Products Co., General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

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Headquarters for oxygen, acetylene and other gases . . . carbide . . . gas welding and cutting apparatus and supplies . . . arc welders, electrodes and accessories

low cost PORTABLE GAS CUTTING MACHINE

cuts steel faster . . . more economically

Airco No. 10 Radiagraph set-up for cutting inside and outside circles.

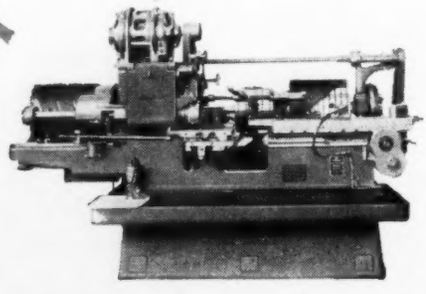
This shows the No. 10 Radiagraph simultaneously cutting two straight lines with 45° beveled edges.

CLEVELAND* IS NOW IN CINCINNATI

WE'VE MOVED. The *Cleveland Automatic Machine Company now has a new home. To gain enlarged and modern plant facilities, our main factory and offices have been re-located in Cincinnati. Shown above is our new plant.

In the function of Cleveland Automatic Machines, however, there has been no change. Wherever production of large or small quantities of turned and formed parts is required—at high speeds, low costs and to close tolerances—Cleveland Automatics *do* that job. And Clevelands *cut* costs.

Cleveland Automatic Model B-18" Shaft Machine. For automatic, economical production of multiple diameter shafts, spindles, studs, bolts, etc.



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SPEED TREAT STEEL

MEDIUM HIGH CARBON FOR HEAT TREATING

THE FASTEST CUTTING OPEN HEARTH STEELS MADE TODAY

. . . and while you are waiting for these steels to become more available

DO THIS AT OUR EXPENSE . . . .

Write us for samples. When you receive them we will send our Production Expert to you, at our expense. He will show you, in your own plant, how SPEED CASE and SPEED TREAT will increase your production 30 to 100% . . . and lengthen tool life 2 to 5 times. These SPEED STEELS are worth waiting for.

Tear off here **ATTACH TO YOUR LETTERHEAD AND MAIL TO EITHER COMPANY BELOW**

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YOUNGSTOWN, OHIO

MANUFACTURERS OF A COMPLETE LINE OF COLD FINISHED CARBON AND ALLOY STEEL BARS

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MONARCH STEEL COMPANY

HAMMOND · INDIANAPOLIS · CHICAGO

PECKOVER'S LTD. Toronto, Canadian Distributor

ACTUAL PHOTOGRAPH

Speed Case Steel (.20 carbon) 1 inch cold drawn bar tied in a knot, cold, without fracture.

FARREL SPINDLE ASSEMBLY FLOATS

MILL UNIVERSALS

IN WORKING POSITION

This Farrel-designed spindle assembly gives floating support to the spindles . . . permitting full universal action and eliminating extra burden on either pinion stand or roll bearings.

The lower spindle bearing rests on steel springs, easily accessible for height adjustment. The upper spindle is hydraulically counter-balanced, its bearing being supported by bars extending from a crosshead fastened to the top of the hydraulic cylinder ram. The vertical motion of the upper spindle is actuated by the movement of the mill itself, the hydraulic counterbalance only supporting the spindle so that it is maintained in proper position at all times.

The hydraulic cylinder in the base of the housing receives oil pressure from an accumulator which has a gas-loaded chamber. A pump and motor are employed to build up accumulator pressure and maintain it, in case of leakage, by means of a hydroelectric switch control.

The spindles themselves are of high strength steel, with a heavy cast Meehanite housing for bearing support.

This unit is another example of how Farrel designs and builds equipment to fit the job. Write for complete details of any of the production machinery mentioned on this page.

FB-376

FARREL ROLLING MILL MACHINERY

Rolls	Mill Pinions
Rolling Mills	Pinion Stands
Rod Mill Tables and Manipulating Equipment	Gear Drives of any Capacity
Universal Mill Spindles	Flexible Couplings
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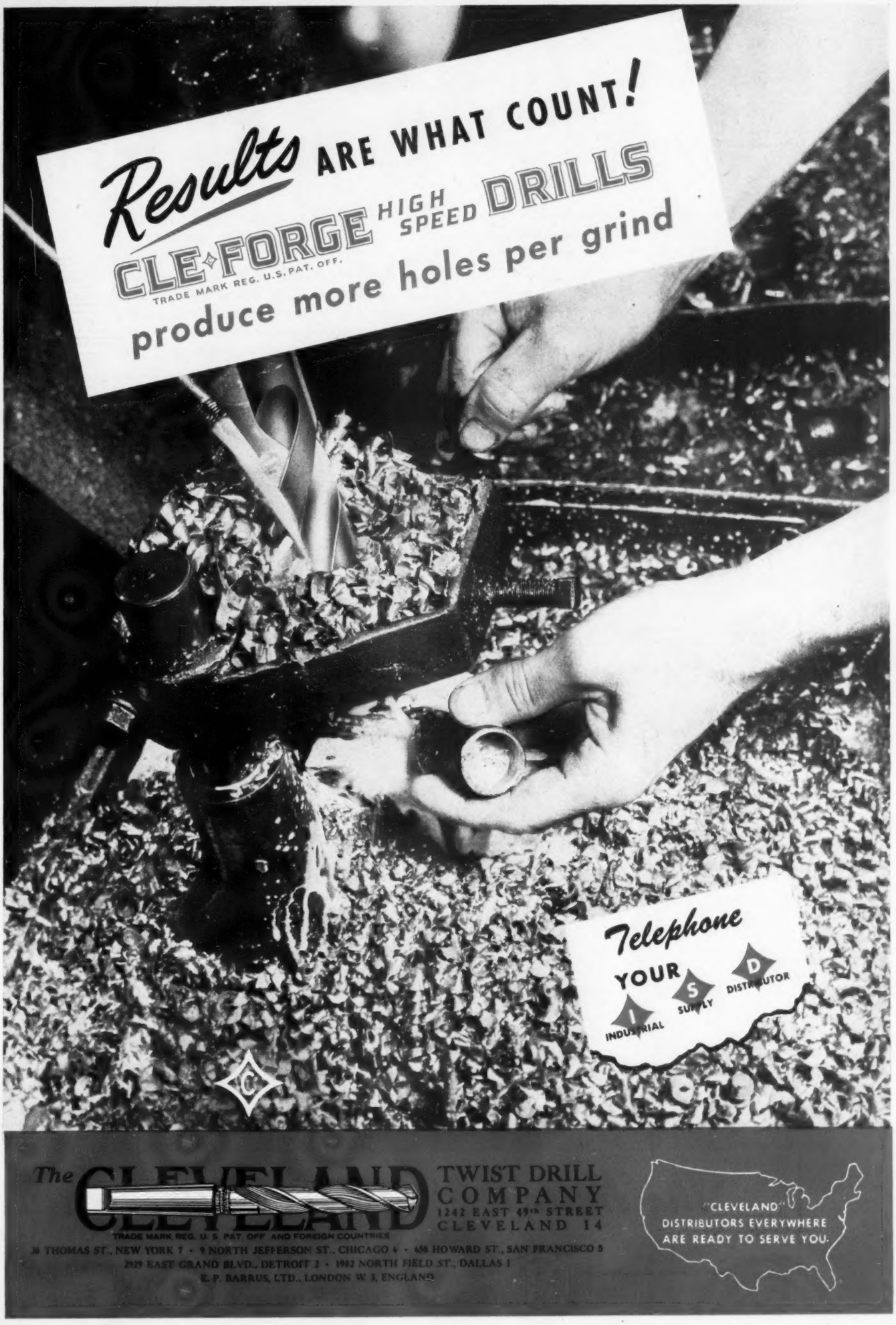
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CLE-FORGE HIGH SPEED DRILLS
TRADE MARK REG. U.S. PAT. OFF.
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"CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU.

automatic shears by HALLDEN

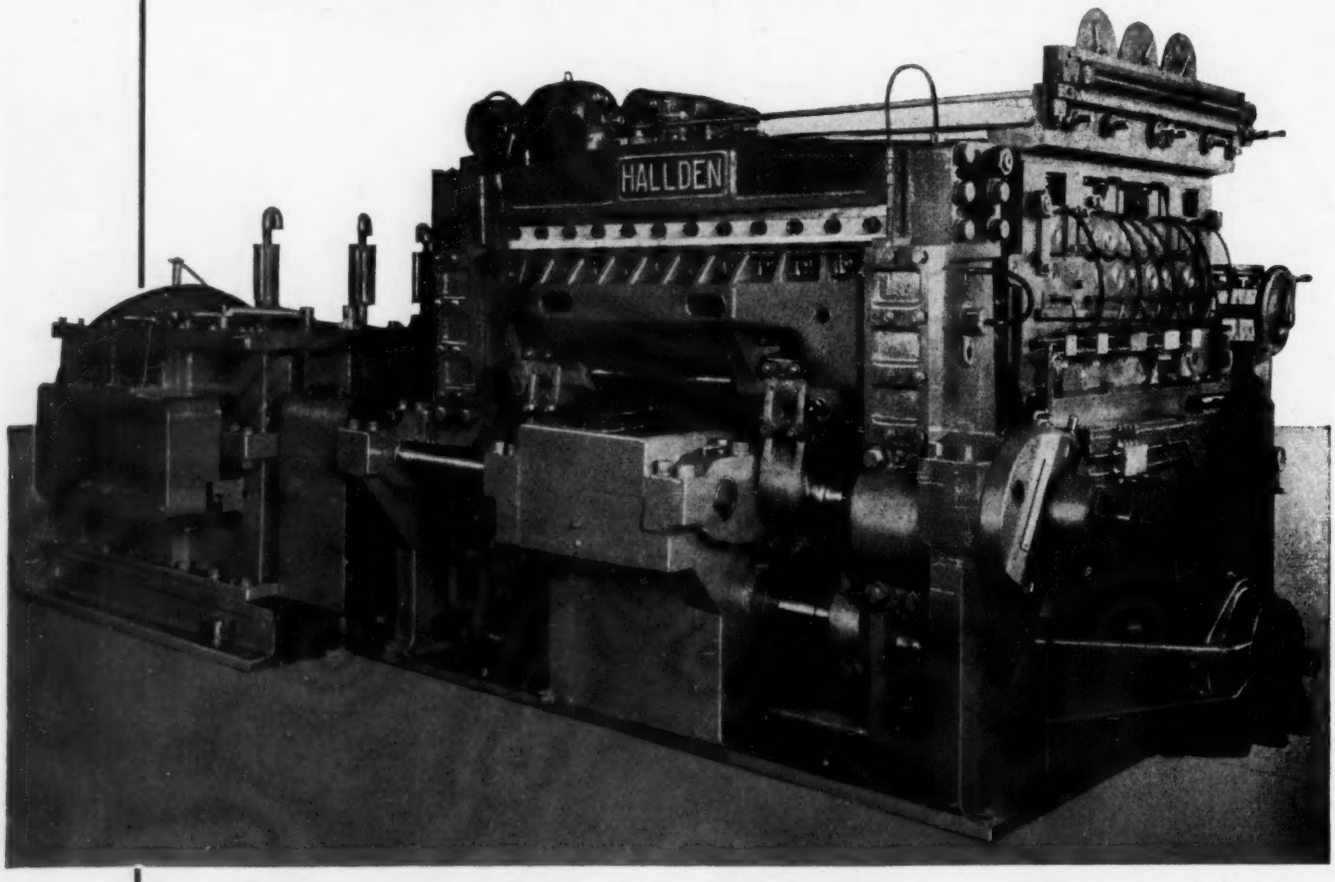
Here's a machine that takes the strip metal from coil, hot bed, or trimmer, flattens it, cuts it accurately into pieces of predetermined length, and piles the pieces neatly upon a conveyor, table or truck. It is a triumph of Hallden engineering.

Consisting of two units, a flattener and a flying shear, it is driven in combination and so timed that during the period of cutting off, the shear moves forward with the exact speed of the metal. The flying shear is a rocker type guillotine design, constructed of a special alloy welded steel. Shear knives are standard type. Each blade has four cutting edges; top and bottom blades are interchangeable, and both blades always move in a mutual plane.

The flattener consists of a 10-roll flattener with two pairs of feed rolls, each roll driven through a coupling. Flattening rolls are constructed of an alloy chrome steel, hardened and ground to a scleroscope of 90. All rolls are easily removed for grinding.

The machine is designed to cut the metal lengths to an accuracy of 1/32 of an inch. Heavy and rugged, with a low center of gravity, it stands up under continuous service without any attention other than oiling. Simple, rugged and entirely automatic, it is very compact and requires little space.

Hallden Automatic Flattening and Cutting Machine for ⅛" Thick Steel Strip No. 56



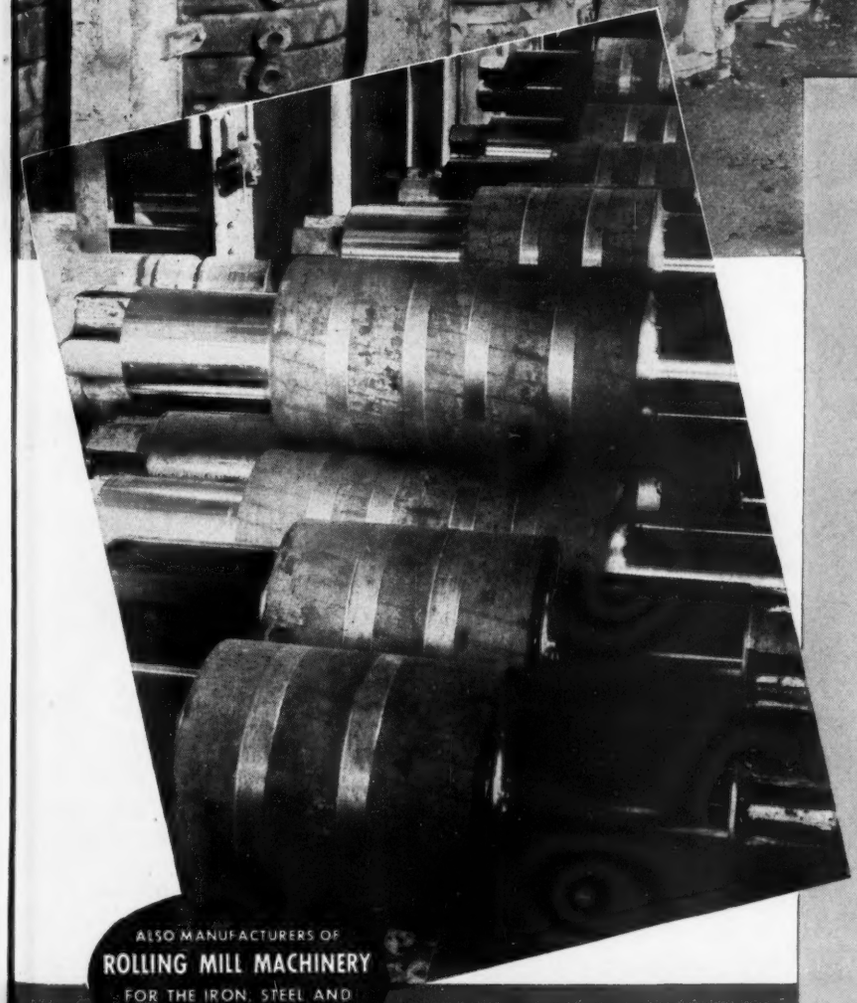
The Hallden Machine Company

THOMASTON, CONNECTICUT

SALES REPRESENTATIVES

THE WEAN ENGINEERING COMPANY, INC., WARREN, O.

W. H. A. ROBERTSON & CO., LTD., BEDFORD, ENGLAND.



THE BIRTH OF LEWIS ROLLS

Most small rolls are poured in practically the same manner as shown above. It's what goes *into* the molds that has given Lewis Rolls the reputation for the maintenance of peak production of rolled metals—from billets to foil.

ALSO MANUFACTURERS OF
ROLLING MILL MACHINERY
FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

LEWIS FOUNDRY & MACHINE

DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH, PA.

Ever hear OF A "STANDARD" TUNNEL?

EXCEPT, perhaps, for toy railroads, neither did we. All tunnels are essentially "just holes in the ground"; yet they must be engineered, excavated and finished *individually* to meet widely-varied conditions.

Likewise, though all production heat treat furnaces are essentially "just heating devices", there's a tremendous variation in operating conditions. *That's why there are no "standard" Holcroft furnaces.*

Each Holcroft installation is designed *individually* to fit the requirements of its specific application, as determined by consultation with your own plant men. Having no "favorite" type of heating, construction or mechanisms, Holcraft engineers select from all possible design features the ones which are *best suited to the job at hand*—often creating improvements in the process. The result is a "tailor-made" installation which is *right* for the job—providing the volume and quality of production required, *with utmost operating economy.*

Before you order heat treat furnaces for production work of ANY kind, check into the advantages of a Holcroft furnace individually designed for the job.

ELECTRIC AND COMBUSTION

Furnaces

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

SINCE 1916—THE BEST IN DESIGN AND CONSTRUCTION

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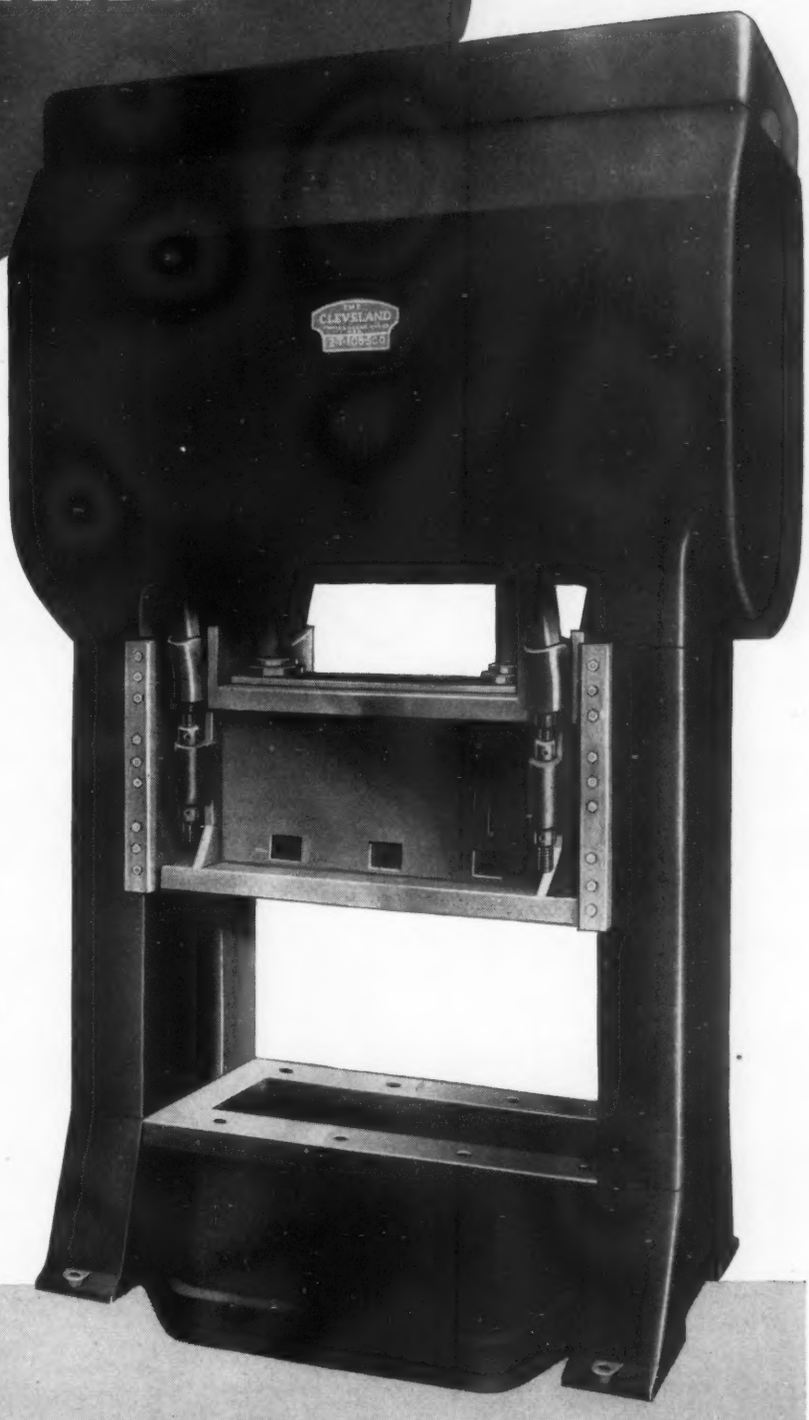
CANADA: WALKER METAL PRODUCTS, LTD., WALKERVILLE, ONTARIO

The NEW Modern CLEVELAND

TWO POINT DOUBLE ACTION TOGGLE PRESS



DESIGNED along the same general lines as our standard Single Point, Two Point and Four Point Single Action Presses, this Modern Cleveland Two Point—*Double Action* Toggle Press is arranged with the gears and drive unit enclosed in the box type crown and is equipped with an electrically controlled air operated friction clutch and brake. The gears run in a bath of oil.

Both the inner, or forming slide; and the outer, or blankholder slide, are designed with extremely long bearing surfaces, so as to provide ample bearing surface even when the slides are at the extreme end of their stroke. The blankholder slide is counterbalanced by air, the cylinders being enclosed in the uprights.

While the following specifications apply to the Press illustrated, this type of Press can be furnished in sizes and capacities to meet particular requirements.

Stroke of inner slide 28″.
Adjustment of inner slide 6″.
Area of inner slide 89″ x 40″.
Capacity of inner slide 500 tons.

Stroke of blankholder 26″.
Adjustment of blankholder 6″.
Area of blankholder 101″ x 60″.
Capacity of blankholder 300 tons.

MODERN *Presses*

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Cleveland 14, Ohio
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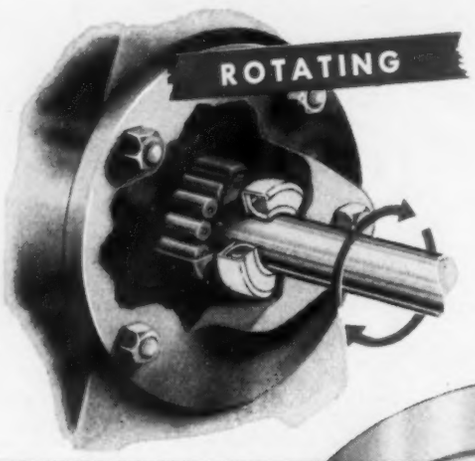
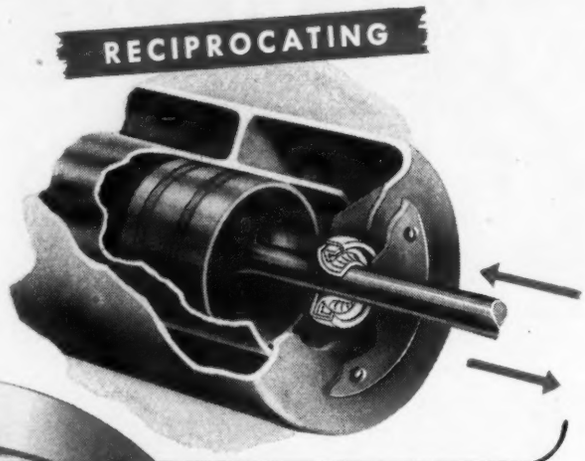
The Simple Effective Way to Seal Shafts





"PERFECT" Oil Seals

PATENTED

THEY DO:	THEY DO NOT:
1—Retain lubricant	1—Permit entrance of foreign matter
2—Prolong bearing life	2—Need adjustment or attention
3—Reduce bearing maintenance	3—Rotate with the shaft
4—Use little space	4—Wick lubricant away from bearing
5—Cost very little	5—Score the shaft

Consult Chicago Rawhide Engineers for Specific Application Information

25

CHICAGO RAWHIDE MANUFACTURING COMPANY

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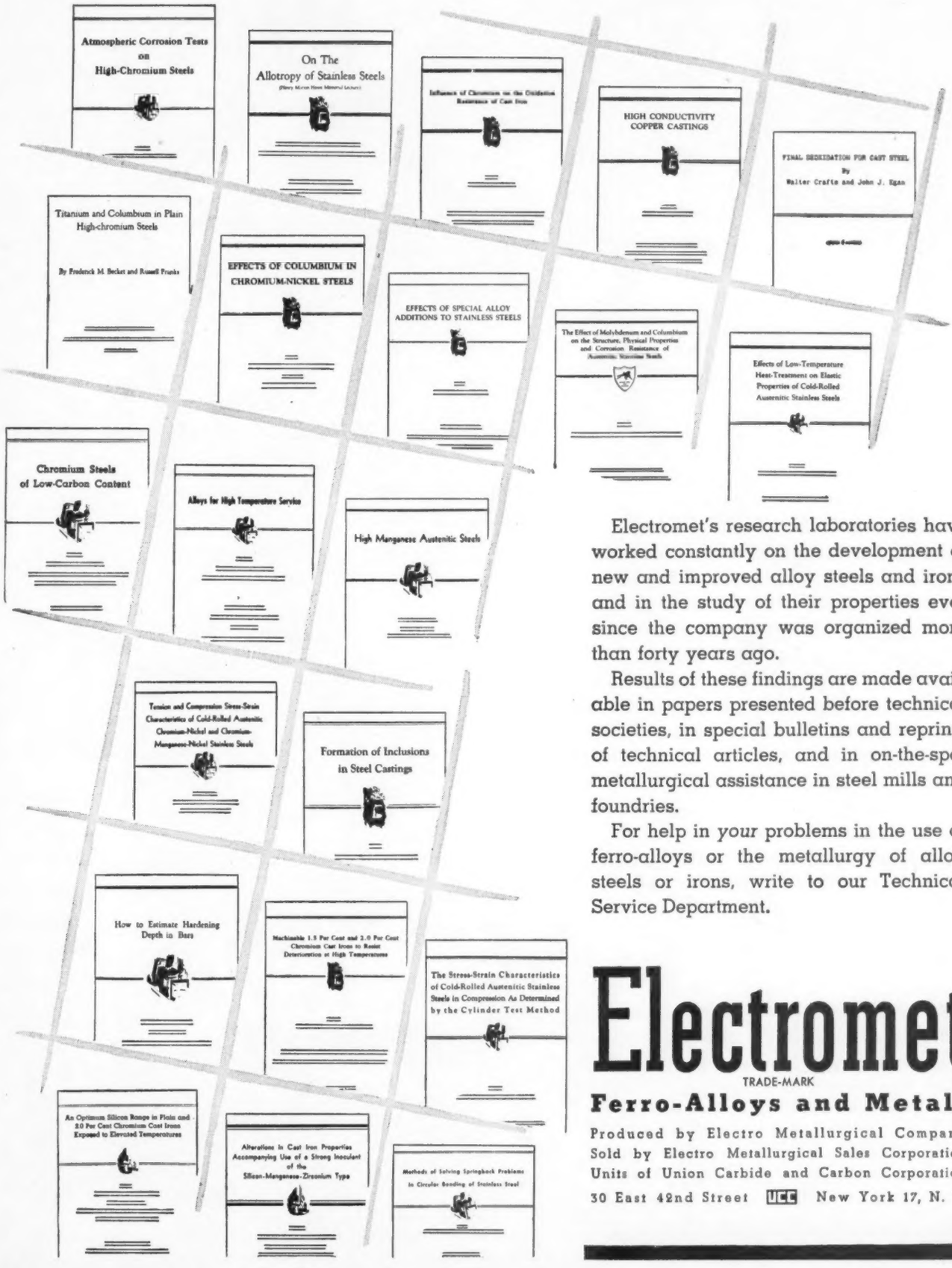
67 YEARS MANUFACTURING QUALITY MECHANICAL LEATHER GOODS EXCLUSIVELY AND NOW SIRVENE SYNTHETIC PRODUCTS

FACTS FOR STEELMAKERS...
from Electromet Research


Atmospheric Corrosion Tests on High-Chromium Steels
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HIGH CONDUCTIVITY COPPER CASTINGS
FINAL DEOXIDATION FOR CAST STEEL
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Tension and Compression Stress-Strain Characteristics of Cold-Rolled Austenitic Chromium-Nickel and Chromium-Manganese-Nickel Stainless Steels
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Electromet's research laboratories have worked constantly on the development of new and improved alloy steels and irons and in the study of their properties ever since the company was organized more than forty years ago.

Results of these findings are made available in papers presented before technical societies, in special bulletins and reprints of technical articles, and in on-the-spot metallurgical assistance in steel mills and foundries.

For help in *your* problems in the use of ferro-alloys or the metallurgy of alloy steels or irons, write to our Technical Service Department.

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Sold by Electro Metallurgical Sales Corporation
Units of Union Carbide and Carbon Corporation
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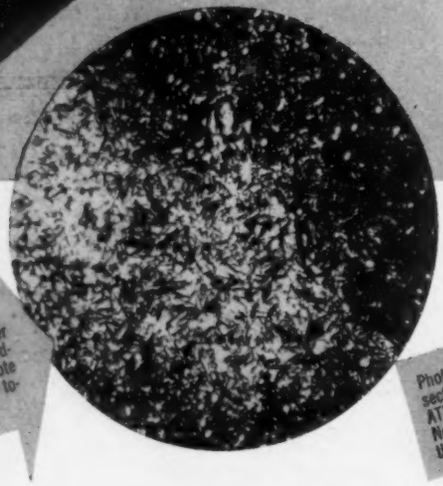
...isn't it time for a change?

YESTERDAY

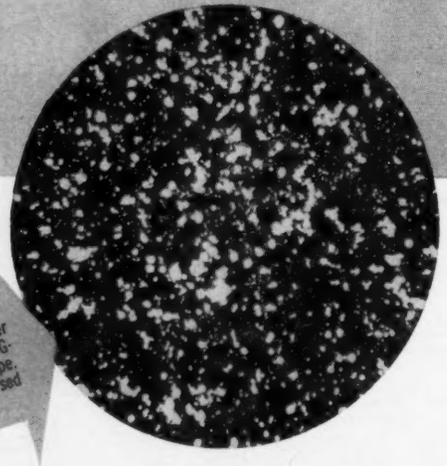
Carbide segregations in high alloy steels were accepted as a necessary evil. The hard brittle areas that thus resulted caused trouble during machining and heat-treating and led to service failures.

...TODAY

LATROBE offers dispersed-segregate steels, an original development which assures you tool and die steels free from former objectionable carbide segregations. These advanced steels set new standards of uniform quality, better performance, longer life!



Photomicrograph of center section 2¾" round, standard process M-2 type. Note segregations clustered together.



Photomicrograph of center section 2¾" round, DESEGATIZED Brand of M-2 type. Note segregates dispersed throughout structure.

Once the clock stood still, now it moves forward. Once you had to put up with tool failures and die break-downs, now you can change to Latrobe's *DESEGATIZED* Brand of Dispersed-Segregate Steels.

Write for either or both of our new bulletins, describing Latrobe's Desegatized Brand of Dispersed-Segregate Steels—one on High Speed Tool Steels and the other on High Carbon-High Chrome Die Steels.

LATROBE

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LATROBE ELECTRIC STEEL COMPANY • LATROBE, PENNSYLVANIA

Bulletin 609

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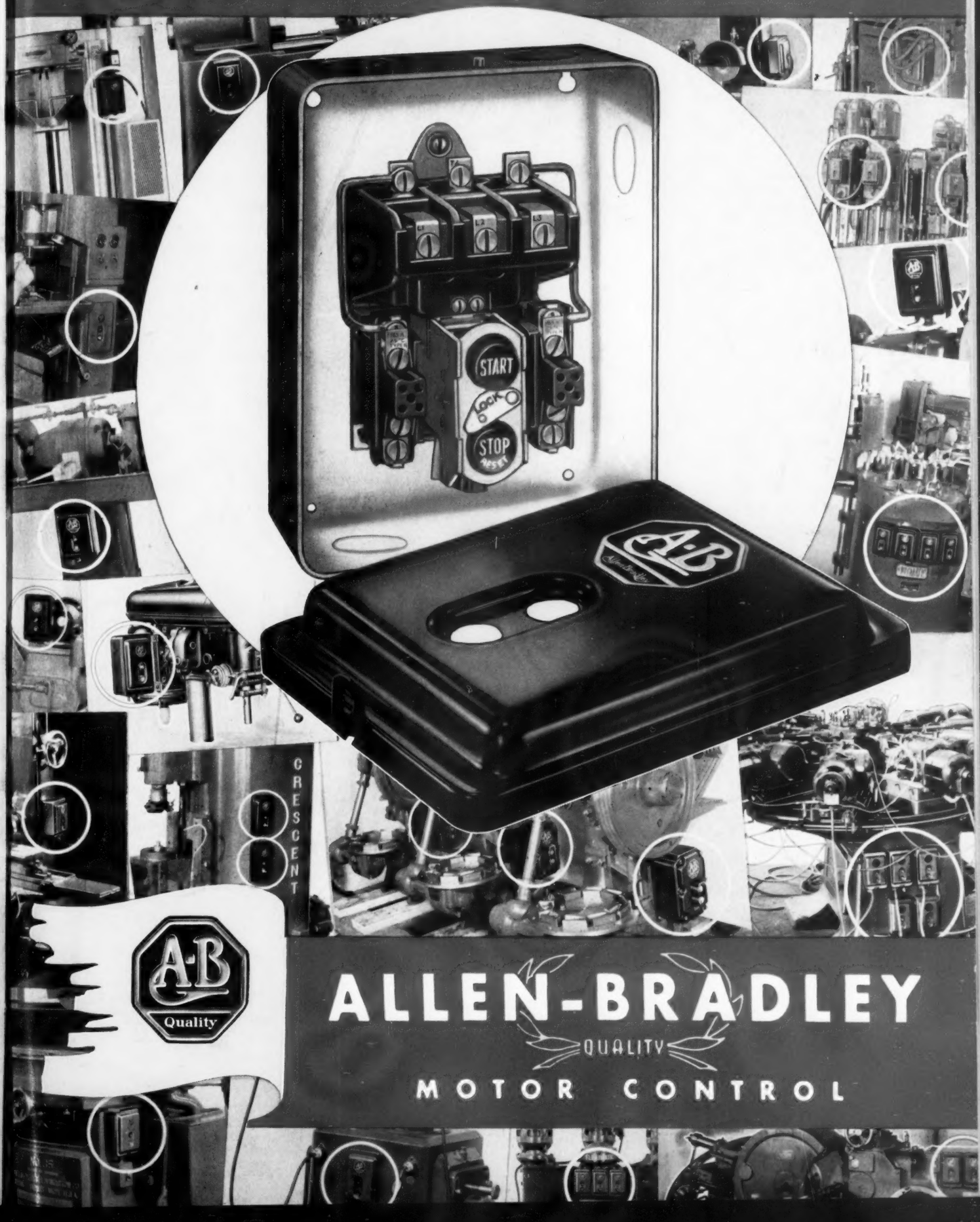

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MOTOR CONTROL

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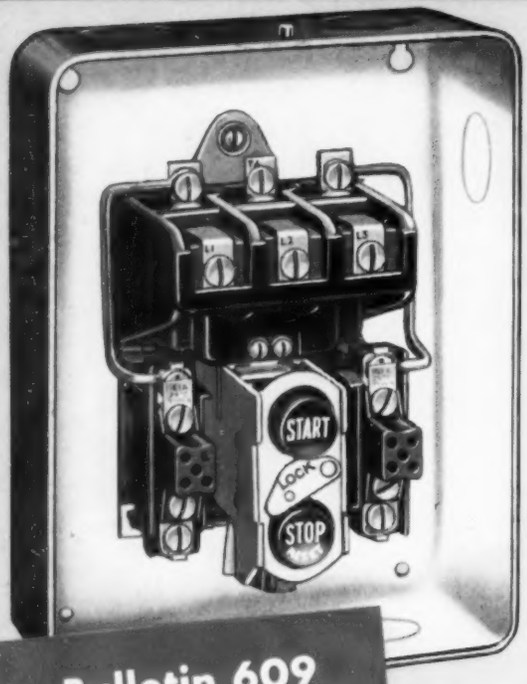


Bulletin 609 HAND-OPERATED MOTOR STARTER

DOUBLE BREAK SILVER ALLOY CONTACTS Any oxides that may form on these contacts are good electrical conductors. That's why cleaning, dressing, filing, or contact maintenance of any sort is unnecessary.

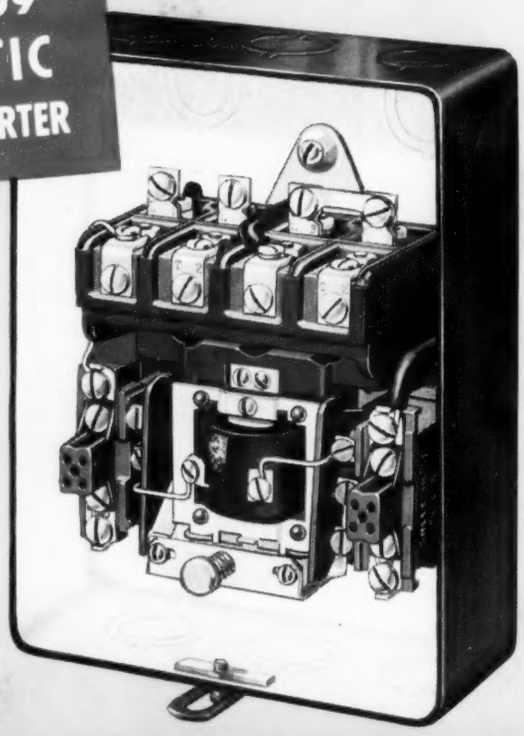
QUICK MAKE AND QUICK BREAK CONTACT ACTION The simple cam and roller switch mechanism opens and closes the contacts with a snap action. The contacts cannot be "teased." This prevents welding of the contacts and assures long contact life.

MOTOR OVERLOAD PROTECTION Two thermal breakers open the main switch contacts and protect the motor in case of sustained overloads. After they trip, pressing the "stop" button resets the overload breakers.

WHITE INTERIORS White enameled cabinet interior reflects light and illuminates the starter in dark places, making installation easy.

Bulletin 609 hand operated motor starter is the modern starter for small a-c line start motors. This ruggedly built unit will give years of trouble free operation. Push button operated. Although it is the smallest starter on the market for its rating, it has generous space for wiring.

Bulletin 709 AUTOMATIC SOLENOID STARTER



NO CONTACT MAINTENANCE The straight line motion prevents contact rebound and practically eliminates contact welding. The double break silver alloy contacts never have to be cleaned or dressed.

EFFICIENT SOLENOID MECHANISM The solenoid magnet will operate at line voltages far below normal, assuring positive contact pressure at all times and preventing motor shutdowns when voltage regulation is bad.

ONLY ONE MOVING PART The only moving part is the solenoid plunger which operates practically without friction. There are no pins, pivots, hinges, or bearings to gum up or corrode and cause trouble.

GENEROUS SPACE FOR WIRING The compact solenoid switch mechanism, white cabinet interior, numerous knockouts, accessible terminal connections, and removable cabinet cover combine to make installation easy.

Here's the most widely imitated starter on the market—the unit that revolutionized modern motor control design and proved its superiority under the toughest service conditions. Write for complete information, Allen-Bradley Company, 1316 S. Second St., Milwaukee 4, Wisconsin.

A-B Quality

ALLEN-BRADLEY

QUALITY

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18-8 stainless plus

HERE at Lebanon we often put plus factors into 18-8 castings which give added and very desirable characteristics to these justly famous stainless alloys. For example, in Circle Ⓛ 21* the addition of columbium in a fixed ratio to the carbon content of the alloy is recommended by us when the casting is to be part of a welded assembly. Acting as a carbon stabilizer, it protects a carbide breakdown at the weld which would jeopardize the corrosion resistant qualities of the alloy at that point.

That's why Lebanon's Circle Ⓛ 18-8s are not just Stainless but Stainless PLUS.

Write for new Data sheet giving chemical analysis and physical properties of all Circle Ⓛ Alloys.

***LEBANON CIRCLE Ⓛ 21**

NOMINAL ANALYSES

Carbon Max.	0.07
Silicon	1.25
Manganese	0.75*
Chromium	19.50
Nickel	10.50
Columbium	0.80

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	80,000
Yield Point	41,000
Elongation in 2"—%	45
Brinell Hardness	145

LEBANON STEEL FOUNDRY • LEBANON, PA.

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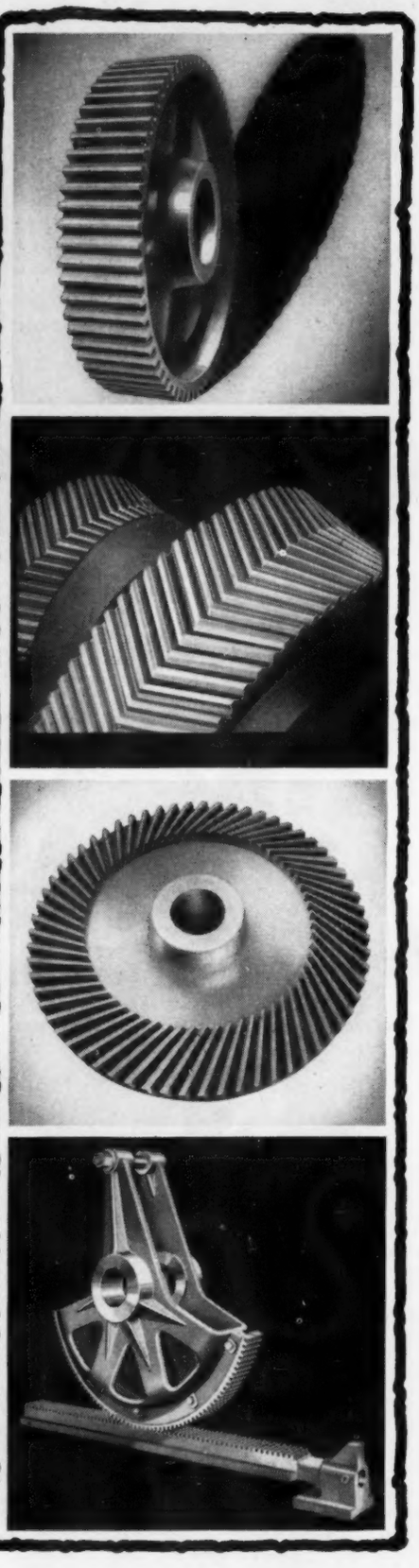
Lebanon CIRCLE L ALLOY AND STEEL Castings

We are still "Headquarters" for GOOD GEARS of All Types, Sizes and Materials



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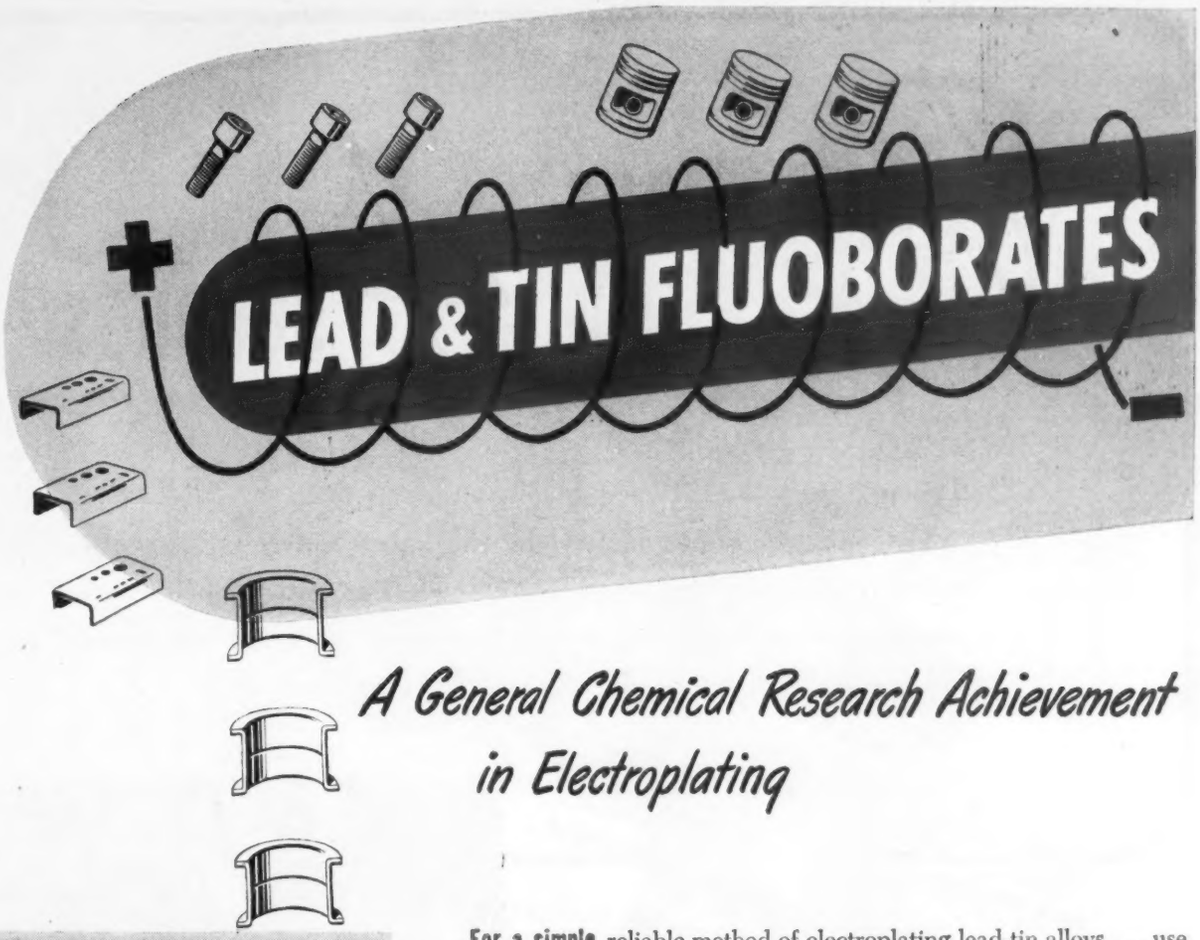

A General Chemical Research Achievement in Electroplating

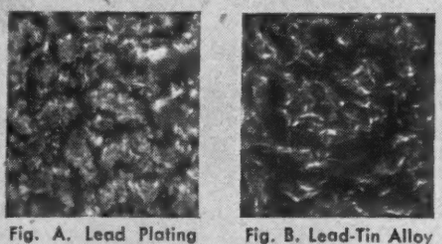

Fig. A. Lead Plating (100% Lead—0% Tin) *150 Diameters*

Fig. B. Lead-Tin Alloy Plating (91% Lead—9% Tin) *150 Diameters*

When tin is plated out simultaneously with lead from General Chemical Lead and Tin Fluoborate solutions, the lead-tin alloy plate obtained consists of a smooth, even cover in contrast to the grainy surface of the lead plate alone.

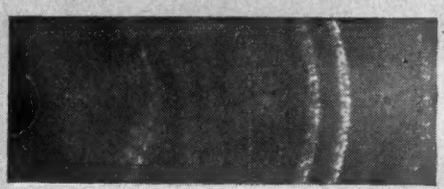

Fig. C. X-ray pattern of Lead Plating.

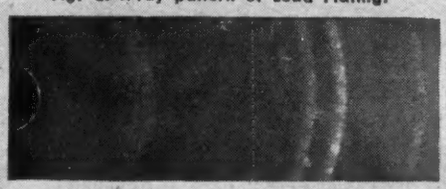

Fig. D. X-ray pattern of Lead-Tin Alloy Plating (91% Lead—9% Tin)

Coarse grain spots in Fig. C coalesce in Fig. D to form more uniform lines, indicating finer grain structure. Only lead lines appear in both patterns since the tin atoms have entered the lead lattice to form an alloy in Fig. D.

For a simple, reliable method of electroplating lead-tin alloys . . . use General Chemical Lead and Tin Fluoborate Solutions. With these developments of General Chemical Fluorine Research, you have a practical, economical means of plating lead-tin alloys in any desired ratio with a minimum of control measures.

General Chemical Lead and Tin Fluoborate Solutions used in baths with dual or alloy anodes plate out dense, fine-grained, lead-tin alloy deposits uniformly and simultaneously *with the tin easily controlled at low ranges.*

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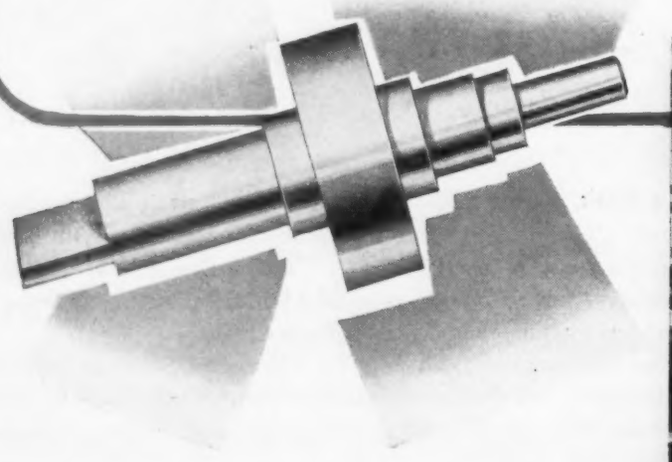
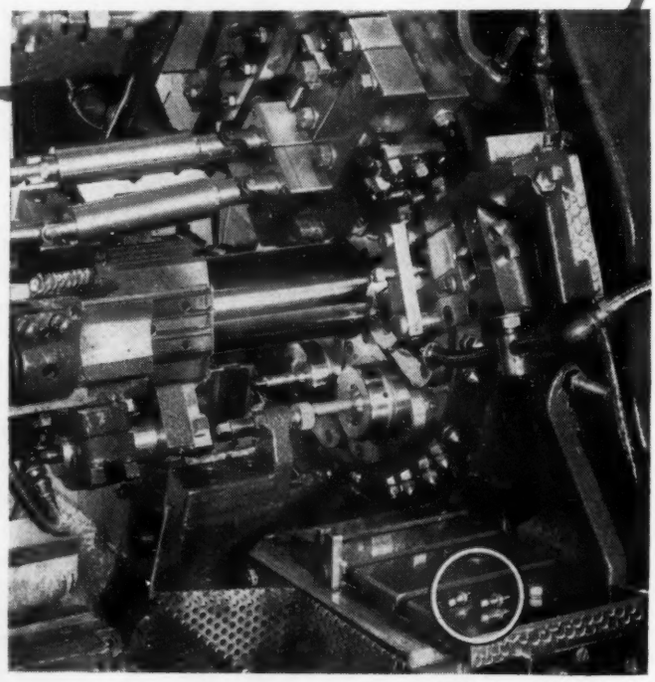
8 operations in 4 seconds

The part is a brass pinion blank, one inch long, 3/8" diameter.

The eight operations include shaving six diameters for fine concentricity, and milling flats on large end. The entire job is completely finished in 4 seconds machine time—900 finished parts per hour. This is *fast* production time.





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Improved methods of tooling and handling parts are important factors by which Acme-Gridley 4, 6 and 8 spindle automatics are making new cost-reduction records in hundreds of mass production shops.

This they accomplish by reducing *machine time*—a vital consideration when both raw material costs and hourly wage rates are at high levels.

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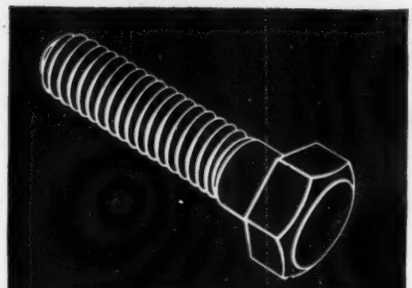
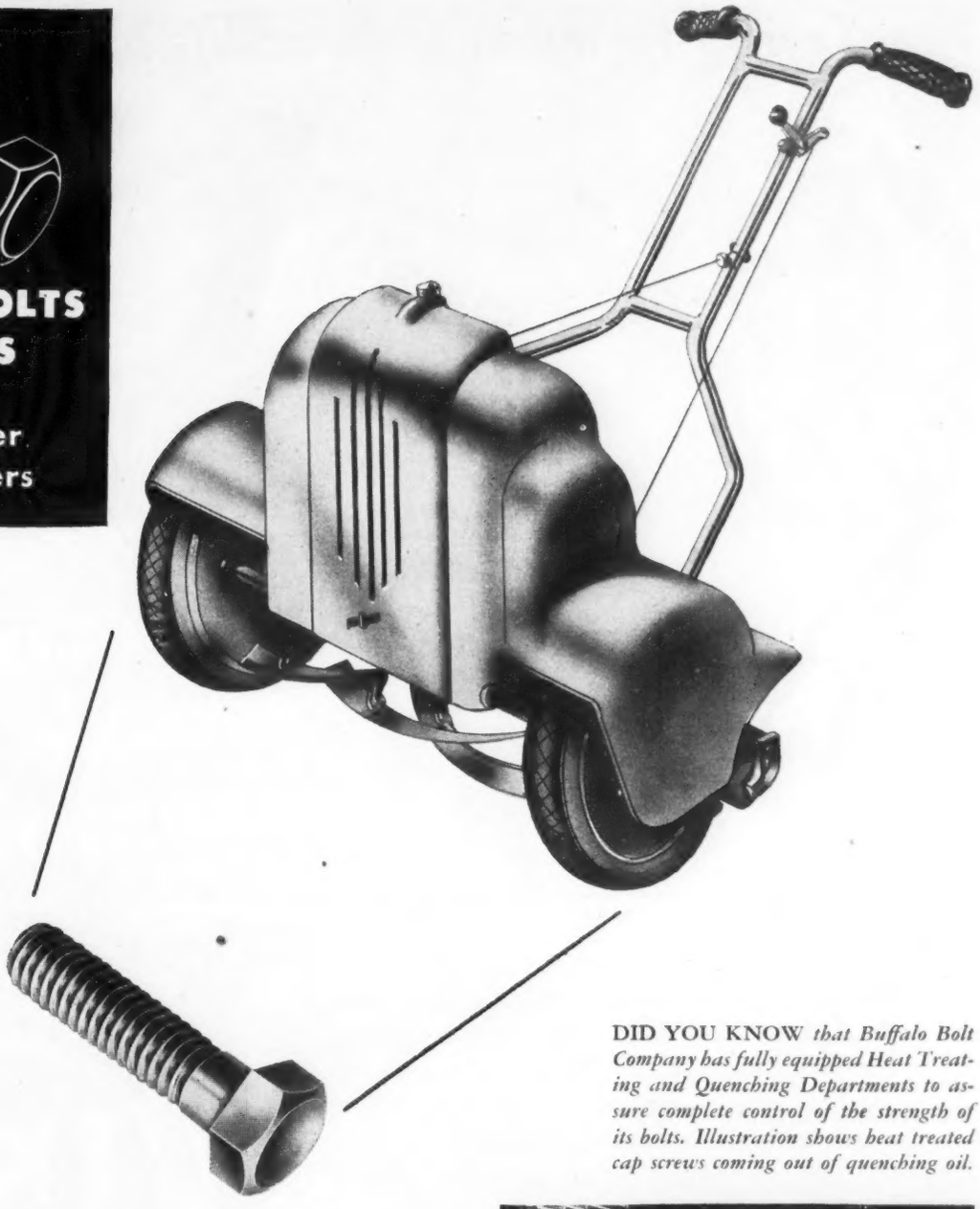


LITTLE BOLTS DO BIG JOBS

for

Lawn Mower Manufacturers



DID YOU KNOW *that Buffalo Bolt Company has fully equipped Heat Treating and Quenching Departments to assure complete control of the strength of its bolts. Illustration shows heat treated cap screws coming out of quenching oil.*

● The economy and dependability of present-day power lawn mowers is due in no small measure to the stamina of the fasteners with which they are assembled. That's why the Circle Ⓑ Buffalo Bolt illustrated . . . a product noted for its uniform size and strength . . . is so widely used on well-known makes of power mowers.

The controlled quality of Circle Ⓑ Fasteners . . . both special and standard . . . is of importance to all manufacturers in two ways: Quality bolts eliminate production delays . . . and they assure that the manufacturer's product will stand up in service. To enjoy these benefits, make it a practice to assemble your products with Circle Ⓑ quality fasteners.

Ⓑ BUFFALO BOLT COMPANY

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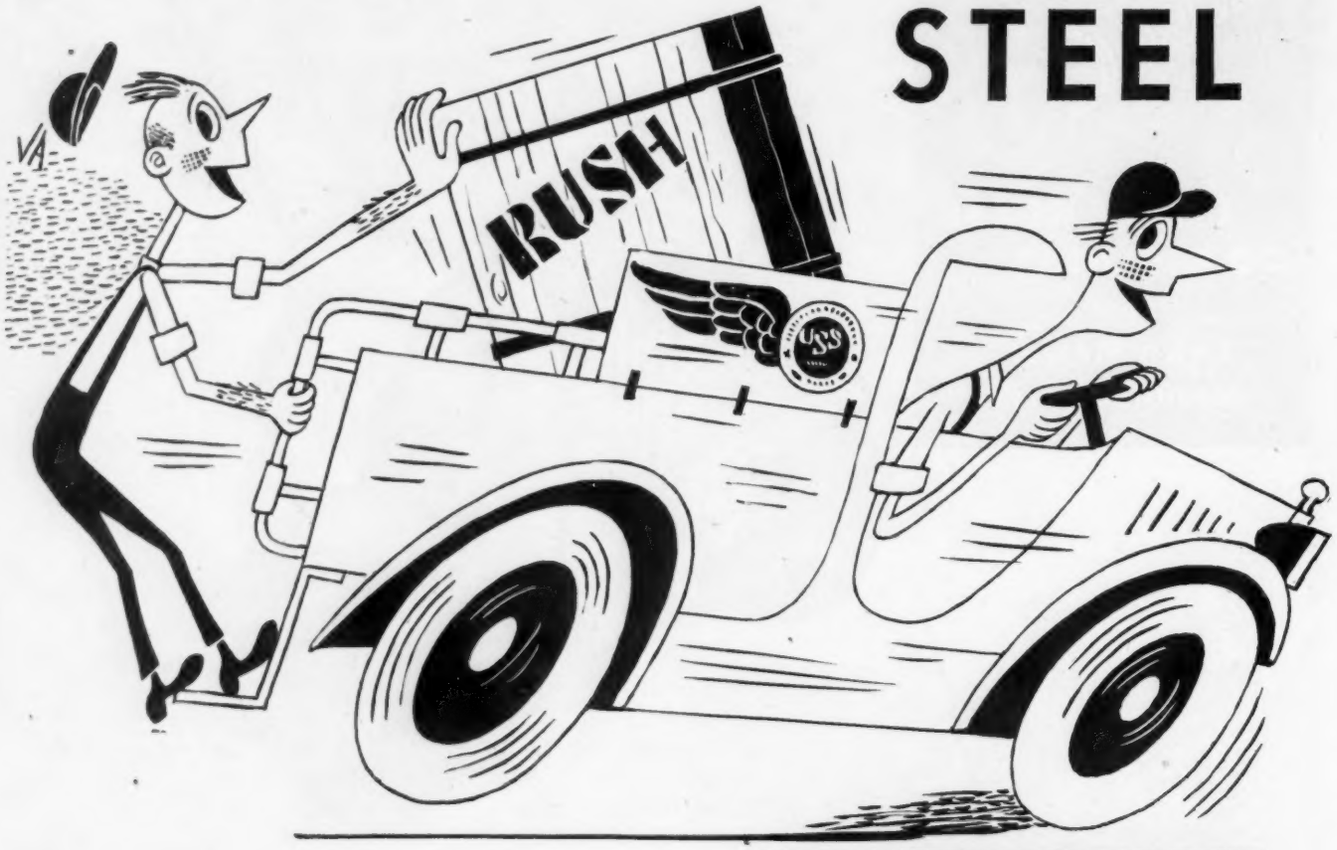

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Various types for use in electric arc welding of ferrous and non-ferrous metals. Diameters range from 3/32" to 3/8", in 14" and 18" lengths packed in boxes.

WELDING RODS

Various types for use in either gas or electric arc welding of both ferrous and non-ferrous metals. Various diameters, from 3/32" to 3/8" in 36" lengths, available in boxes or packages.

NEED WELDING WIRE?

You can get a quantity of low cost high quality standard welding wire in wrapped coils. Simply contact the WAA office nearest your location, and order now the wire you need.

EXPORTERS! Your business is solicited. Much material which is surplus in the United States is urgently needed or is readily salable in other countries. Watch for other offerings, many of them may be of interest to your clients.

Have your name put on the mailing list to receive further offerings of welding rods.

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with Monarch's Shapemaster Lathe

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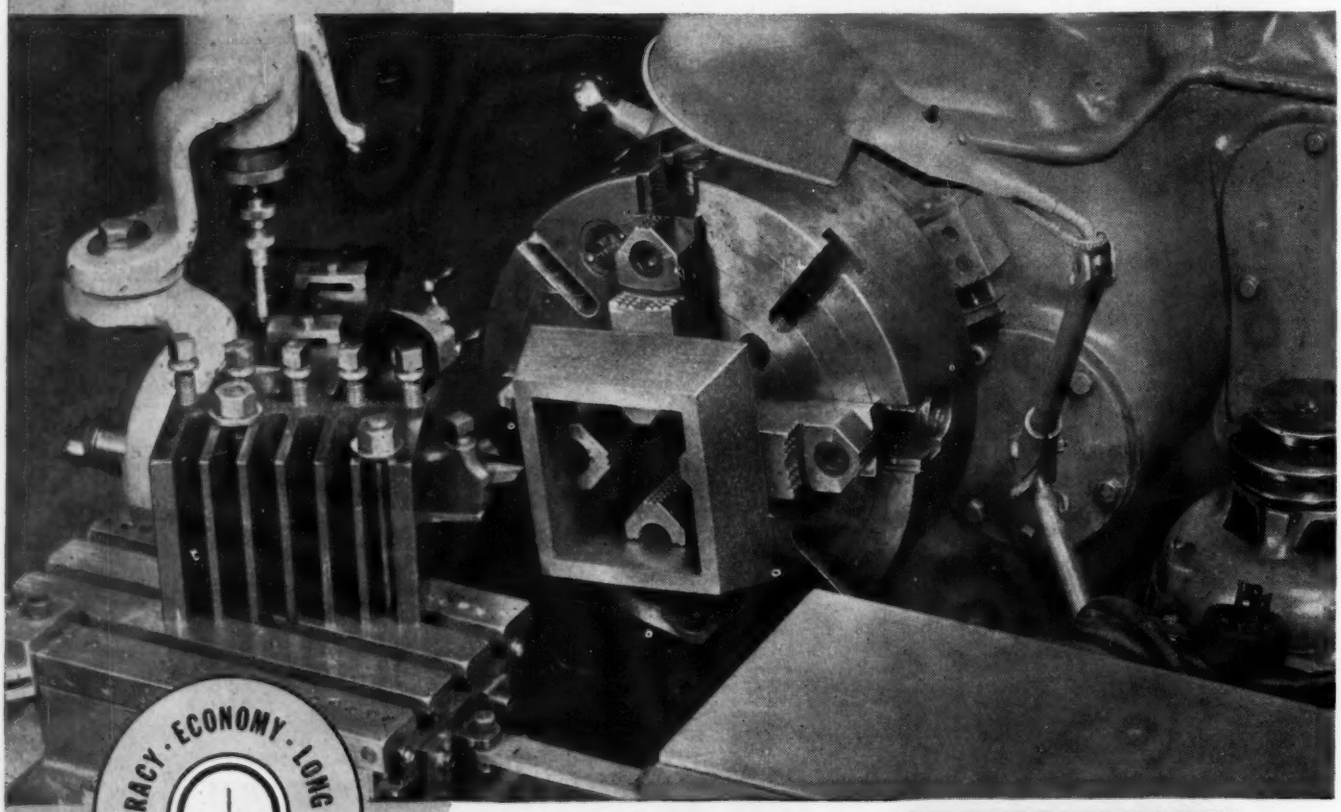

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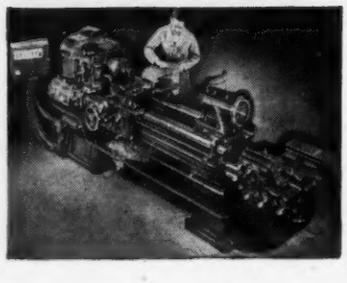

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Spraying in Electrostatic Zones
Flame Hardened Steel
X-Ray Inspection of Castings

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 120, NO. 18 May 5, 1947

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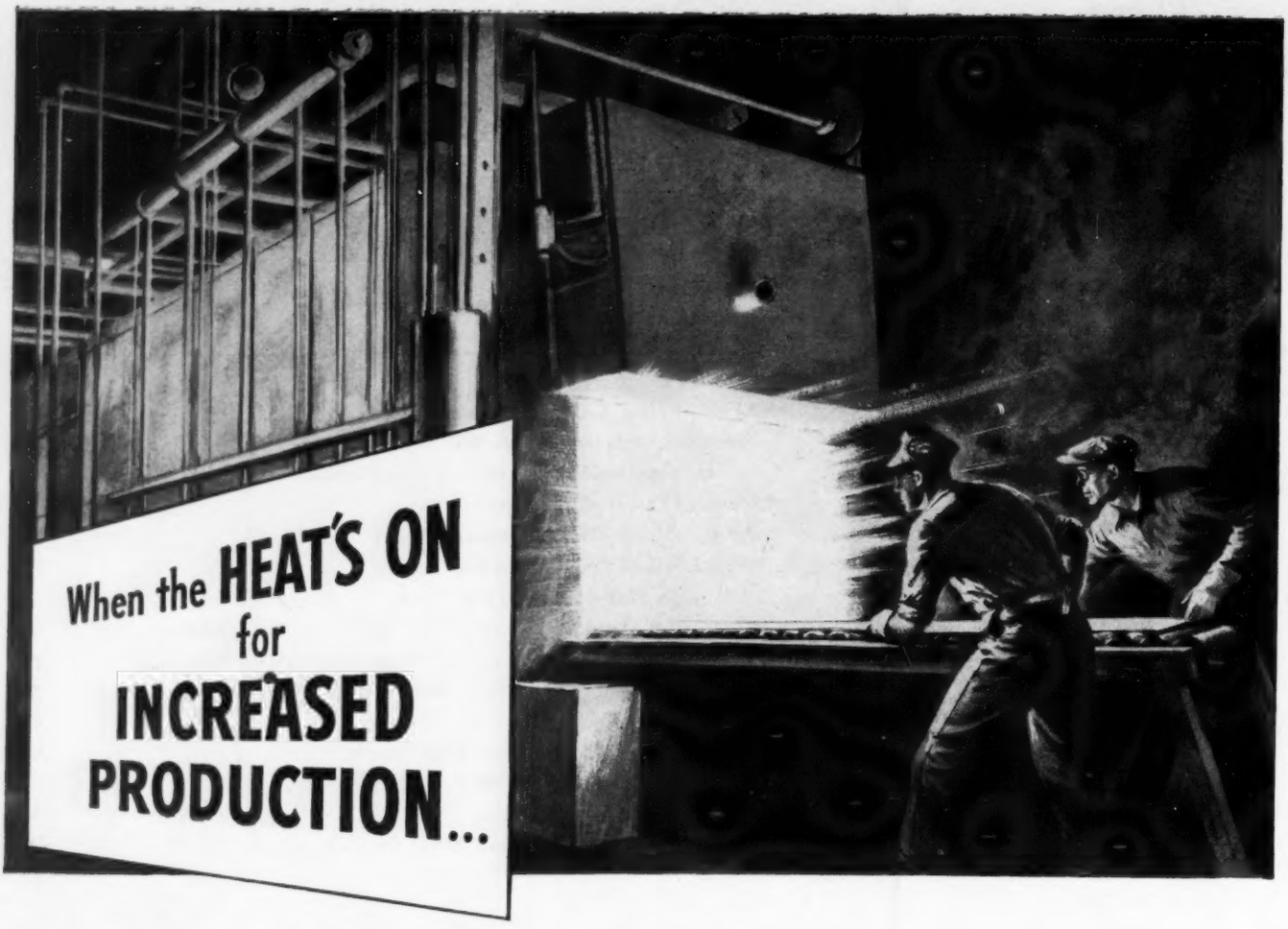

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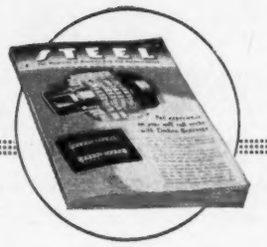


May 5, 1947

Dangerous Medicine

Readers have been sending in clip sheets of comments by economic observers who suggest gingerly that a dose of mild depression would be a healthful tonic for the nation.

These arguments are quite convincing. Their authors point out that a minor recession would cure many of the present ills suffered by persons in varied walks of life. It is alleged that a touch of mild hardship would make the worker more responsible and more likely to do an honest day's work for his liberal wage. It would chasten the greedy union leader who has been out to get all the traffic will bear. It would force management to work harder to control costs and to develop greater efficiency. It would compel more realistic pricing on the part of manufacturers, wholesalers and retailers. It would teach farmers to rely more upon their skills and less upon subsidies paid by the government. It would discourage citizens from patronizing black markets and encourage them to develop a better sense of true values. It would scare politicians into cutting down on the waste of taxpayers' money. In short, it would hasten the descent of many persons from the heights of inflation-induced recklessness to the bedrock of peacetime realism.

Many readers will agree that this reasoning is sound, insofar as it applies to individuals and institutions that still are hypnotized by the false attractions of an inflated economy. Certainly it is true that a little rough going would do wonders for those who have lost their sense of values.

But what about the millions of Americans on fixed incomes who are trying to meet 1947 prices with prewar or near prewar salaries, pensions or dividends? Do these people need a recession to bring them to reality? They do not need the educational or disciplinary lesson of hard times; they need relief from oppression.

Also, what are the likely political repercussions of even the mildest of recessions? With the experience of 1933 in mind, can we be sure that a slight dip into recession will not revive the idea among politicians that an "emergency" exists and that billions of public funds must be spent for dubious relief and even more dubious social experiment?

Until the nation becomes more literate in the fundamentals of economics, we cannot flirt with the idea of a depression as an educational or disciplinary agency. Our best bet is to work for economic stability all the time.

• • •

HOW TO PRICE STEEL? In considering the factors which enter into the problem of steel supply, one is likely to underestimate the importance of the abolition of Pittsburgh plus.

While the legality of the single basing point system has been tested in the courts time and time again, it was not until the late thirties that governmental action caused steel producers to progressively abandon Pittsburgh plus in earnest. If the war had not intervened the effect of this abandonment would have been felt at least six or seven years ago. Because war controls on the distribution of steel obscured all pricing techniques, the real import of the departure from Pittsburgh plus has not been apparent until during the past few months.

It is unfortunate in some respects that the responsibility for developing a workable substitute for Pittsburgh plus had to come during a sellers' market. With demand far exceeding supply, it is difficult for sellers to justify the concessions required to serve distant buyers. The situation has embittered distant loyal customers of long standing and subjected sellers to unjust criticism.

It remained for R. C. Todd, vice president of

(OVER)

AS THE EDITOR VIEWS THE NEWS

American Rolling Mill Co. to emphasize the importance of the abandonment of Pittsburgh plus in the present steel situation. It is a problem that deserves the attention of the ablest market men engaged in buying and selling steel. —p. 73

• • •

FIELD FOR YOUNG MEN: Many who attended the 51st annual meeting of the American Foundrymen's Association last week in Detroit thought that it was a particularly successful significant event.

This high appraisal was based upon the attendance of 3500, which far exceeded that of any previous annual convention which had not been held concurrently with a foundry equipment exhibition, and also upon the keen interest displayed through the technical and business sessions. All evidence pointed to the fact that foundrymen are searching for pertinent technical information regarding their business more earnestly and more objectively than ever before. The making of good castings is a science rather than an art and foundrymen are keenly aware of this fact.

Perhaps it was recognition of this progress that prompted George T. Christopher, president of Packard Motor Car Co. to declare at the general meeting on Monday that the foundry field offers exceptional opportunities for enterprising young men seeking careers in industry. This was a well merited tribute to progressive foundry management. —p. 70

• • •

ONLY 8 OUT OF 21: At the meeting of the American Zinc Institute in St. Louis last week, E. F. Lundeen, metallurgical engineer of Inland Steel Co., cited the present status of 21 galvanizing plants that suspended operations during the war. He reported that seven have not resumed, three have become captive plants and presumably have no galvanized sheets to sell, two are producing chiefly for wholly-owned fabricating plants and one is in restricted production. This leaves only eight plants to supply open market demand.

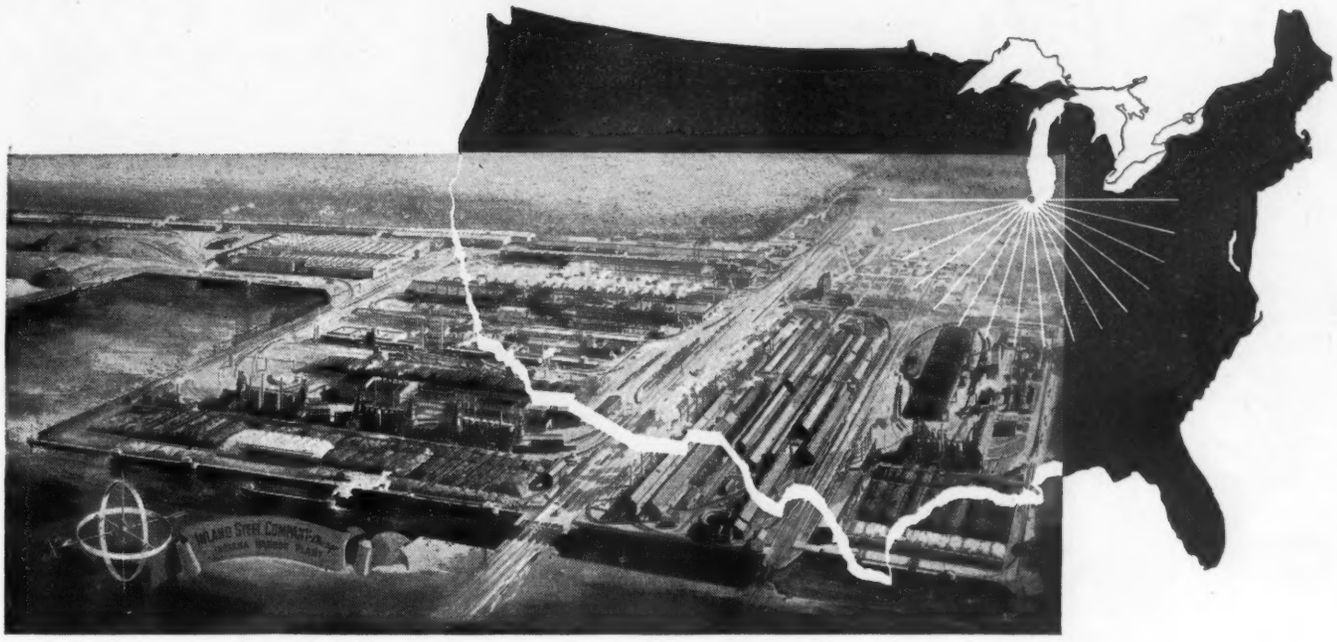
This situation in galvanized sheets is similar in many respects to that existing in many other branches of the metalworking industries where processing and fabricating facilities that formerly were serving general customers now are producing exclusively for their owners or for affiliated companies.

Such a distortion of supply and demand cannot continue indefinitely. Once a buyers' market returns, suppliers will be eager to cater to open market demand. —p. 72

SIGNS OF THE TIMES: Patent attorneys, alert to the implications of two Supreme Court decisions, are urging manufacturers to use caution in applying for patents (p. 77) whose use is covered by a license agreement containing a price-fixing clause and "improvement" patents which cover a new device for the better utilization of existing devices . . . . Ringwood iron ore mines in New Jersey will begin operations June 1. It is expected 100,000 tons of ore will be taken out in 1947 (p. 81) and that output will mount to 300,000 tons annually when operations get into full swing . . . . A survey made jointly by Securities & Exchange Commission and Department of Commerce shows that construction of new plants and purchase of new equipment during 1947 is expected to cost about $13.9 billion. Of this amount (p. 86) $6.2 billion will be spent by manufacturing companies . . . . A construction method that employs standard stamped truck body members and simple fabricating techniques (p. 96) offers new opportunities for steel stampings. Flexible design permits body builders to meet individual truck owners' requirements, using mass-production facilities for custom-built bodies . . . . Open hearth men meeting in Cincinnati were told that the savings effected by using the oxygen lance for refining open-hearth heats are nearly the same as those obtained from oxygen-enriched air (p. 107) and that oxygen with a purity of 95 per cent may be produced for 18 cents per 1000 cubic feet . . . . Department of Commerce is under congressional scrutiny regarding its appropriation. If a reported reduction of 25 per cent goes into effect, it will curtail many existing and projected departmental activities (p. 76), including possibly the proposal that the department issue monthly iron and steel market reports to be based upon information obtained by reporters in 14 field offices. One wonders on what grounds the originator of this idea justified the use of taxpayers' money for a service that would duplicate—inadequately and too long after the event—services already rendered by privately-operated publications . . . . L. E. Osborne, vice president of Westinghouse Electric, points out (p. 102) that an American workman can earn one day's food for his family by an hour and a half of work, whereas a Russian workman must labor 10 hours for the same result. The explanation is that the Russian has the benefit of only about one-sixth the mechanical power that is available to the American.

E. L. Shaner

EDITOR-IN-CHIEF



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Mounting Costs To Impede Price Reductions

New wage pattern will necessitate some increases, but majority of metalworking firms hope to hold prices steady. Reductions announced by scattered companies. Industry still uncertain as to extent of advance in manufacturing costs

PRICES for steel and the products of the metalworking industries generally will not weaken substantially in the weeks immediately ahead.

Some prices will go up.

A few will be reduced.

The great majority will be held at or near present levels.

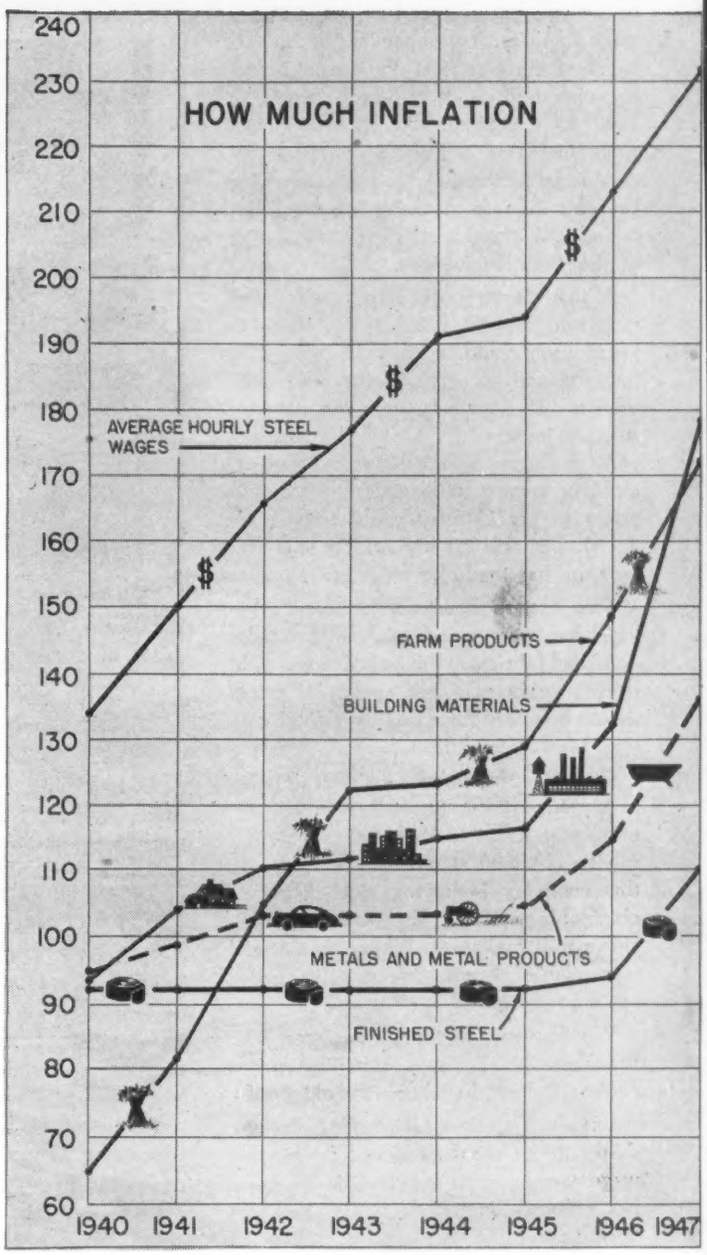
These are conclusions from a spot check by STEEL of leading metalworking companies and from analysis of pricing policy statements of steel producers and metal goods manufacturers following emergence of the new wage pattern.

In the picture are many conflicts and many uncertainties. Manufacturers want to lower prices—to avoid pricing themselves out of the market, domestic and foreign, and to avoid the inflation which they recognize will take a heavy toll later. Overall corporate earnings in the first quarter were good. Had wages and other costs held, substantial price reductions would have been possible over a wide range of metal goods.

However, the new wage increases of about 15 cents an hour will offset in large degree the favorable earnings of the first quarter. In the steel industry, the wage increase will add about $3.25 a ton to steelmaking costs in direct labor alone; how much more will be added by indirect labor costs cannot yet be ascertained. Leading steel producers are agreed that the best they can hope to do under the new wage schedule is to hold prices at present levels, and some are dubious of their ability to continue to absorb the added costs.

The electrical equipment industry will make some price increases. General Electric Co. estimates these advances will average 7 per cent. Westinghouse Electric Corp. says it will make increases in some lines of apparatus, but has not yet announced the extent of the advance.

Another electrical equipment manufacturer told STEEL



Price increases on finished steel and on other metals and metal products have been relatively modest in comparison with those on farm products, building materials and wages. Chart above shows the movement of these prices since 1940 on the basis of 1926 prices (1926=100).

Average hourly earnings of steelworkers have advanced about 73 per cent since 1940, and 131 per cent since 1926. Farm products have gained 153 per cent since 1940 and are 72 per cent above 1926. Building materials are up 88 per cent since 1940 and 79 per cent since 1926.

Base prices of finished steel have advanced only 10 per cent since 1926 and currently are 18 per cent above 1940. Metals and metal products, including iron and steel, agricultural implements and machinery, motor vehicles, nonferrous metals and plumbing and heating, are 38 per cent above 1926 and 43 per cent above 1940.

Indexes for finished steel and steel wages compiled by STEEL; for metals and metal products, farm products and building materials, by the Bureau of Labor Statistics, Department of Labor.

prices will be advanced as result of the wage increase. This manufacturer points out that the electrical equipment industry operated on a reduced margin in 1946 as compared with 1945. Current wage increases and the many price increases in materials which are occurring prevents him from doing anything but taking the position that the economics of the situation justifies.

A manufacturer of bolts, screws and nuts said he did not believe prices in his industry could be reduced, but should be increased as result of the new wage grants. This manufacturer reports costs still are increasing.

A producer of machine and cutting tools, in answer to STEEL's inquiry, said prices in his industry could not be reduced, but will go higher. To date this year, he has made no price revisions.

Two eastern hardware companies believe hardware prices will hold steady.

A steel fabricator thinks prices will hold steady, although he contends prices should be raised for sound operating practice. Market conditions, however, are expected to forestall such an increase.

A midwestern stovemaker anticipates no change until steel and other materials can be obtained at mill prices. Currently this company is buying steel wherever obtainable and at prices considerably above mill quotation. When the material is available at mill prices, stove prices can be reduced.

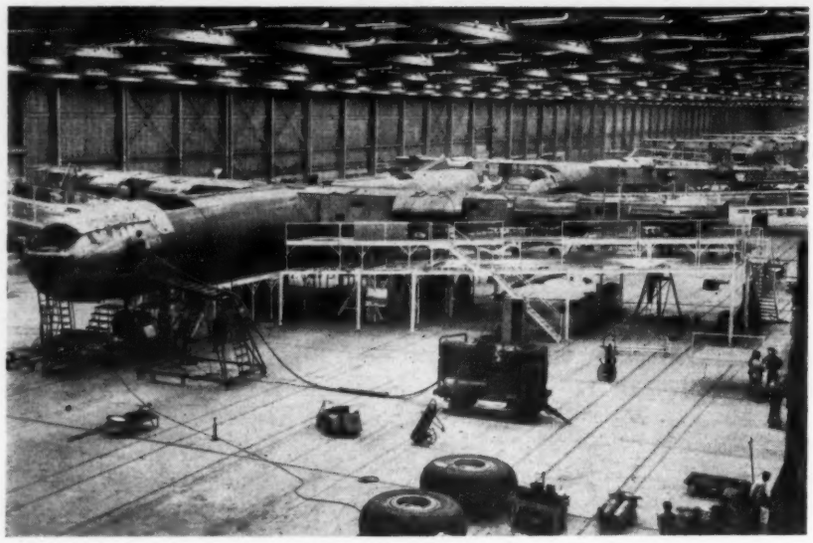
Woodhaven Metal Stamping Inc., Brooklyn, N. Y., says stamping prices either will be reduced or will hold steady.

Buffalo Gasoline Motor Co., Buffalo, thinks prices can be reduced despite the wage increase and reports the company has reduced quotations within the past 30 days.

Some Prices Reduced

A number of metalworking companies have announced price reductions since the dimensions of the new wage pattern became apparent. Among these are Thompson Products, Cleveland, which cut prices on some products up to 15 per cent; Bowdil Co., Canton, O., manufacturer of high speed steel bits, which cut prices 2 cents a bit; Cleveland Graphite Bronze Co., Cleveland, which announced reductions aggregating $2,500,000 annually on the present volume of business.

A handful of other companies announced that with the emergence of the new wage pattern, they will resume quoting of firm prices for items which can be delivered within the next few months; previously, they have been quoting on a basis of prices at time of delivery or including an escalator clause in the contract. Many steel and equipment companies last week indicated they will continue to quote on prices at time of delivery or continue to include escalator clauses.



SIX-ENGINE BOMBERS: In full production at Consolidated Vultee's Fort Worth, Tex., division are these six-engine B-36s, capable of carrying 10,000 lb of bombs 10,000 miles without extra fuel tanks, or 72,000 lb of bombs for a shorter range

Keystone Steel & Wire Co., Peoria, Ill., has advised customers it is abandoning its policy of "price in effect on date of shipment" for all orders on its books or accepted for second quarter delivery.

Sheffield Steel Corp., Kansas City, Mo., has announced, effective April 28, a reduction of $5 a ton on merchant bars and bar size shapes, which removes a part of the premium under which the company has been operating.

Westinghouse Electric Corp. said it is "preparing to quote firm prices on all products where reasonably short delivery reduces the hazard."

Escalator clauses will be dropped from contracts of the Yoder Co., Cleveland, for mechanical equipment such as tube mills and metal-forming machinery. Certain electrical equipment will continue to be sold under the escalator proviso until electrical suppliers quote firm prices.

Detroit Steel Products Co., Detroit, announced the elimination of escalator clauses in all material contracts and a reduction of 5 per cent in list price of residential steel casement windows.

E. G. Grace, chairman, Bethlehem Steel Co., said he sees no possibility of a reduction in base prices of steel as a result of the wage increase. He said his company is not going to increase prices now, but added it is difficult to tell what the future may hold. The present cycle of wage increases is only beginning to take hold and will be extended to many industries which supply materials essential to steel production. For example, he predicted the coal miners will receive an increase of at least 15 cents an hour when new contracts are concluded and that this will be reflected in the cost of fuel. Effects of the freight rate increase at the beginning of the year and in iron ore are only beginning to be felt.

Mr. Grace said that the industry "would manifestly have preferred to decrease steel prices $3 a ton as a contribution toward stopping inflationary trends" rather than to increase wages.

E. T. Weir, chairman of National Steel Corp., told stockholders at company's annual meeting that if full operations are maintained the industry will be able to absorb the new round of wage increases and make a fair return in 1947. However, "if the industry goes down to, say 70 per cent, there is a question whether the wage increases could be absorbed."

A survey by the National Association of Manufacturers shows that one-fifth of the members of that group have reduced prices on one or more products this year.

Questionnaires were answered by 5742 manufacturers, or more than 36 per cent of the membership. Of those replying, 1194, or 20.8 per cent, said they had cut prices.

More price reductions were reported in food and clothing lines than in metal goods.

This points up the fact that the greatest inflation has occurred in foodstuffs, textiles, beverages and similar nondurable goods and that the first and deepest price cuts should come in these products. Steel and metalworking industry products prices, as illustrated in chart on page 67, have lagged behind the rise in wages and materials. Reductions in these lines logically will be slower in developing than in products where the inflation is greater.

Inland, Roebling Plants Closed as Wage Negotiations Strike Snags

Union calls strikes despite offers of same wage increases and other concessions granted by United States Steel. Majority of producers either have signed or have reached substantial agreement on terms. Nonbasic steel companies struck

REFUSAL by the United Steelworkers-CIO to accept a "union responsibility" clause in a new wage contract last week resulted in a strike closing the plants of Inland Steel Co., Chicago, seventh largest steel producer.

Inland had offered the union wage increases amounting to more than 15 cents an hour and a $2 million fund for the adjustment of inequities, severance pay, increased vacation benefits, and other benefits but insisted on inclusion of provisions to halt wildcat strikes and make the union responsible for its conduct.

At the expiration of the contract extension at midnight April 30, the strike started. Following a strike vote by the union several days previously, Inland had started to bank its blast furnaces and shut down its open hearths. When the strike started five of seven blast furnaces were banked, all open hearths were out and all rolling mills idle. Affected were more than 14,000 employees.

Company officials pointed out that even if the stoppage were only of short duration, it would be costly, both in money and in lost steel production. A week or more will be required to resume operations after the strike ends.

Plants of John A. Roebling's Sons Co., Trenton, N. J., were struck May 1 after the union rejected the same terms agreed upon by United States Steel Corp. and the union. Company management was puzzled as to just what the local union wanted. Company's operations were closed down completely and 5000 workers were idle.

Although many of the larger steel producers had reached agreements, generally patterned after the United States Steel contract, before the April 30 deadline, a number of companies had not completed negotiations on some of the fringe issues. With the exception of Inland and Roebling, the companies and union were continuing negotiations on a day-to-day basis.

Contracts following the U. S. Steel pattern were signed by Bethlehem Steel Co., Republic Steel Corp., Jones & Laughlin Steel Corp., Crucible Steel Co. of America, and Wheeling Steel Corp.

Weirton Steel Co., Weirton, W. Va., whose employees are represented by an independent union, announced a contract embodying provisions somewhat more liberal than those granted the CIO union. Weirton's base pay was raised from $1 to $1.16½ cents an hour, comparing with a raise from 96½ cents to $1.09 granted by companies with CIO contracts. Above the minimum rate, Weirton granted a 12½-cent hourly increase.

American Rolling Mill Co. announced agreement with its employees at Hamilton, Middletown and Zanesville, O., and Butler, Pa., providing average hourly increases of 16 cents, plus fringe concessions. New minimum basic rate becomes $1.14 an hour.

A number of nonbasic steel companies in Ohio and Pennsylvania were struck late last week when they refused to accede to an ultimatum by local officials of the United Steelworkers to meet the wage increase pattern of U. S. Steel "or else." President Philip Murray of the USA earlier had said negotiations with these companies would be at the local plant level and that competitive problems of the companies would be considered.

However, last week, union local officials called on the companies summarily to agree to wage increases of 15 cents or more. When the companies demurred, strike action was taken, sometimes within 24 hours after the union's initial approach.

Among companies struck and the employees affected are: Ohio Foundry & Machine Co., Steubenville, O., 150 workers; Continental Foundry & Machine Co., Coraopolis, Pa., 1500; Union Spring & Mfg. Co., New Kensington, Pa., 800; Pittsburgh Bridge & Iron Works, Rochester, 200; Hanlon-Gregory Galvanizing Co., Pittsburgh, 100; Tri-Lok Co., Pittsburgh, 25; Follansbee Sheet Metals Specialty Co., Follansbee, W. Va.; Hancock Mfg. Co., Toronto, O., 600.

Present, Past and Pending

■ MALLORY DEVELOPS SINTERED ALLOY

INDIANAPOLIS, IND.—P. R. Mallory & Co. Inc. has developed a sintered alloy known as Mallory 1000 Metal which is prepared by powder metallurgy methods and which has density approaching that of tungsten. It is resistant to atmospheric corrosion and to certain acids. It will be used in fixtures in electrolytic processes, in rotors for devices such as gyro-pilots and governors and in containers for radium.

■ APPROVE $400 MILLION BRITISH MODERNIZATION

LONDON—Sir Archibald Forbes, chairman of the British Steel Board appointed by the government last September, has announced that projects for the modernization of steel plants likely to cost more than $400 million have been approved by the board and work is starting. These projects include about two-thirds of the modernization program proposed by the Iron & Steel Federation.

■ ARGENTINA TO ENLARGE STEEL CAPACITY

PITTSBURGH—Argentina will expand its basic steel capacity from 120,000 to 315,000 tons under a five-year program of reorganization and development of the national economy, according to G. D. Thompson, president and chairman, Pittsburgh Steel Foundry Corp., who has just returned from a two-month visit to South America.

■ HOTPOINT TO EXPAND DISHWASHER CAPACITY

CHICAGO—Hotpoint Inc. will spend several million dollars in expanding its plant for the manufacture of side-slide electric dishwashers and will add 250,000 ft of floor space.

■ MENASCO SUSPENDS CONSUMER GOODS ITEMS

LOS ANGELES—Menasco Mfg. Co. has suspended production of its consumer goods items—portable washing machines and auto bumper jacks— to reduce inventories. Production will be resumed when stocks are reduced.

■ BRIDGEPORT BRASS NOTES BUYER RESISTANCE

BRIDGEPORT, CONN.—Some signs of buyer resistance were noted during the first quarter of 1947, due to high prices of copper, Herman W. Steinkraus, president, Bridgeport Brass Co., told stockholders at annual meeting.

AFA Told Big Castings Demand Looms

Speaker at 51st annual meeting of foundrymen at Detroit says castings supply threatens serious bottleneck to auto industry in attaining maximum car output

Convention attracts 3500. Approximately 50 technical papers on gray iron, steel, malleable and nonferrous foundry practice presented at various sessions

SUPPLY of castings will continue to present a serious bottleneck to the automotive industry, even though sufficient steel should become available, George T. Christopher, president and general manager, Packard Motor Car Co., Detroit, told the American Foundrymen's Association at its 51st annual convention in Detroit last week.

Speaking at the opening session of the four-day meeting, Mr. Christopher pointed out that if present production represents ultimate capacity, the foundry industry cannot furnish sufficient castings to meet the automotive industry's requirements for a five to six million car year. He urged the foundry industry to start doing something to meet this heavier demand.

Mr. Christopher said that most of the 5000 foundries in the United States claim they are operating at or near capacity right now, but he felt they can do much better than what they now think is capacity or near-capacity. He declared the foundry industry must make itself attractive to capable workers elsewhere in our factories and to promising youngsters graduating from schools into industrial life.

Bright Prospects for Industry

He said the foundry industry in 1940 had a market potential exceeding $7 billion, and that he knew of no industry with brighter prospects and greater opportunities for advancement.

"There are fresh opportunities in foundry design and layout, in furnace practice, control of materials, metallurgy, laboratory facilities; in pattern and molding equipment, more efficient sand-handling and mixing machinery; in cost control, good housekeeping and safety practice —in fact, in every phase of the foundry operation," he said. "Full of predictables, the foundry industry is still a field without horizons—wide open for ingenuity and enterprise."

Concluding, Mr. Christopher said the foundry industry probably will succeed steel as the principal bottleneck in the production of automobiles. Therefore, foundrymen should take inventory as quickly as possible—and start doing something about the liabilities at once!

MAX KUNIANSKY
Newly Inducted President, American Foundrymen's Association

"There has been considerable talk about a bust, a recession, and adjustment, or whatever you may call it, toward the end of this year," he said. "It may come, of course. But it won't come if everyone resolves to do, and keep on doing, a fair day's work for a fair day's pay. I firmly believe that full production—and only full production—can prevent such a bust!"

Opinion among foundrymen is that if they can manage to obtain sufficient raw materials—pig iron, coke, scrap, foundry supplies, etc., they have ample equipment capacity to take care of the automobile industry's requirements. In other words they do not feel there is a shortage of foundry capacity since many plants could operate extra shifts, or six days a week if they could only locate more materials.

The convention attracted an attendance of approximately 3500, one of the largest for an annual meeting held without the biennial exhibit of foundry equipment and supplies. Approximately 50 papers were presented at the various technical sessions conducted by the various association divisions, relative to gray iron, steel, malleable iron, brass and bronze and aluminum and magnesium castings, in addition to sand, refractories, patterns and other subjects of interest to the industry.

Improved technique in foundry practice and higher quality castings were reflected in conclusions of the various discussions at the numerous technical sessions and meetings of the association's technical committees and subcommittees.

Headquarters for the convention were at the Statler and Book-Cadillac Hotels. The majority of the technical sessions were held at the two hotels, although morning and afternoon sessions on Monday, Apr. 28, were held at the Rackham Educational Memorial.

Although the convention extended four days, arrangements had been made to concentrate the technical program as far as possible, so that the various subjects could be covered within three days or less.

Arthur H. Allen, Detroit editor, STEEL, and chairman of the Detroit Chapter, AFA, presided at the opening session, which also was addressed by Mayor Edward J. Jeffries Jr. of Detroit, and S. V. Wood, AFA president and president of Minneapolis Electric Steel Castings Co., Minneapolis.

New Officers Elected

Mr. Wood presided at the annual business meeting Wednesday afternoon, at which new officers and directors of the association were elected as follows:

President, Max Kuniansky, vice president and general manager, Lynchburg Foundry Co., Lynchburg, Va.; vice president, W. B. Wallis, president, Pittsburgh Lectromelt Furnace Corp., Pittsburgh.

Directors for 3-year terms were elected as follows: E. N. Delahunt, general superintendent, Warden King Ltd., Montreal; W. J. MacNeill, general manager, G. H. R. Foundry Co., Dayton, O.; R. H. McCarroll, chief metallurgist, Ford Motor Co., Dearborn, Mich.; J. M. Robb Jr., resident manager, Hickman, Williams & Co. Inc., Philadelphia; and A. C. Ziebell, president and general manager, Universal Foundry Co., Oshkosh, Wis.

At this same session the Charles Edgar Hoyt Annual Lecture was presented by Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, on "The Cupola Furnace."

Annual rewards for outstanding service to the foundry industry were presented to six persons at the banquet

Thursday evening concluding the meeting. Recipients of gold medals were: Henry S. Washburn, Plainville Casting Co., Plainville, Conn.; Russell J. Allen, metallurgical engineer, Worthington Pump & Machinery Corp., Harrison, N. J.; Harry M. St. John, superintendent, brass foundry and forge shop, Crane Co., Chicago; and Richard A. Flinn Jr., metallurgist, American Brake Shoe Co., Mahwah, N. J. John Grennan, retired foundry practice instructor, University of Michigan, and S. V. Wood, retiring president of the association, were presented honorary memberships.

Principal speaker at the annual banquet was Arthur H. Motley, president, Parade Publications Inc., New York.

ASME To Hear GM and NAM Officials at Meeting

Charles E. Wilson, president of General Motors Corp., Detroit, and Robert R. Wason, chairman of the board of the National Association of Manufacturers and president of the NAM last year, will be among the speakers at the semiannual meeting of the American Society of Mechanical Engineers in Chicago, June 15 to 19. With the Stevens Hotel as headquarters, total registration is expected to reach 3000, exceeding previous records.

Jones & Laughlin Makes Changes in Personnel

Jones & Laughlin Steel Corp., Pittsburgh, has announced the following personnel changes. W. J. Creighton retires from the office of executive vice president but continues in an active advisory capacity as consultant to the chairman of the board of directors. He also continues to be a director and member of the executive committee.

Frank B. Denton, newly elected director, has also been elected a member of the executive committee.

C. L. Austin, heretofore a director and treasurer, was elected to additional offices of vice president and member of the executive committee.

H. Parker Sharp, heretofore a director and general counsel, was elected to additional offices of vice president and member of the executive committee.

V. H. Lawrence, heretofore general superintendent of the Otis Works, Cleveland, was elected a vice president. W. R. Elliot, formerly assistant general superintendent of the Otis Works, has succeeded Mr. Lawrence as general superintendent.

W. H. Dupka, heretofore controller, was elected to the additional office of vice president.

H. W. Graham, heretofore director of technology, was elected to the additional office of vice president.

W. Randall Compton has been appointed assistant to the president.

W. C. Plummer, an attorney of the corporation, was appointed to the additional office of assistant secretary.

Metal Powder Association Meets May 27 in New York

Metal Powder Association will hold its third annual spring meeting May 27 at the Waldorf-Astoria Hotel, New York. Two technical sessions will be featured at the gathering.

Subjects of papers to be read include: "Stainless Steel Powder," by John D. Dale, Charles Hardy Inc.; "New Developments in the Production of Metal Powder Parts," by E. E. Ensign, Ford Motor Co.; "Cost Calculations in the Production of Powder Metallurgy Parts," by Dr. Henry H. Hausner, consulting engineer; "The Use of Metal Powders in the Manufacture of Flake Powders." by Ernest Scheller, Metals Powder Inc.; "Copper-Lead Lined Steel Back Bearings," by E. R. Darby, Federal-Mogul Corp.; "Bushings, Bearings and Allied Fields," by A. J. Langhammer, Chrysler Corp.; and "Electrical & Electronic Fields," by E. I. Shobert, Stackpole Carbon Co.

Pig Iron Production Rises To 5,122,857 Tons in March

Production of pig iron, including ferromanganese and spiegeleisen, increased to 5,122,857 tons in March from 4,549,628 tons in February, according to the American Iron & Steel Institute, New York. This brought the first quarter total to 14,759,671 tons compared with only 8,216,032 tons in the like 1946 period when the strike of steelworkers reduced operations to only 49.5 per cent of capacity. The first quarter total was the largest since 1944 when the all-time high of 15,838,717 tons were produced in the first three months. Blast furnace operations were at 91.8 per cent of capacity in March and 91.1 per cent in the first quarter of this year.

Pig iron production accounted for 5,077,383 tons in March and 14,600,808 tons in the first quarter while ferromanganese and spiegeleisen accounted for 45,474 tons and 158,863 tons in the respective periods.

Calendar of Meetings . . .

May 5-6, American Management Association: Conference on insurance buying policies and their applications to industry's needs, Hotel New Yorker, New York. Association headquarters are at 330 W. 42nd St., New York.

May 5-6, National Welding Supply Association: Annual convention, Philadelphia.

May 5-9, American Gas Association: Industrial Gas School, Seneca Hotel, Columbus, O. Chairman is Karl Emmerling, 420 Lexington Ave., New York.

May 6-8, National Conference on Fire Prevention: Federal Works Bldg., Washington. General chairman is Maj. Gen. Philip B. Fleming, Federal Works Administrator.

May 6-10, Society of the Plastics Industry: Second National Plastics Exposition, Coliseum, Chicago. Society's headquarters are at 295 Madison Ave., New York.

May 8-9, Magnaflux Weld Inspection Conference: Congress Hotel, Chicago. Sponsored by Magnaflux Corp., Chicago.

May 9-18, Aviation Council of Metropolitan St. Louis Inc.: St. Louis Air Fair of 1947. Executive director is Col. G. Tod Bates.

May 12-14, Canadian Association of Equipment Distributors: Annual convention, General Brock Hotel, Niagara Falls, Ont., Canada.

May 12-15, American Steel Warehouse Association: 38th annual meeting, Biltmore Hotel, Los Angeles. Association president is Walter S. Doxsey, 442 Terminal Tower, Cleveland.

May 12-15, American Mining Congress: 1947 annual coal convention and exposition in Cleveland. Association secretary is Julian D. Conover, 309 Munsey Bldg., Washington.

May 12-15, Second Annual National Marine Exposition: San Francisco.

May 15-17, Society for Experimental Stress Analysis: Annual meeting, Stevens Hotel, Chicago. Society's address is P.O. Box 168, Cambridge 39, Mass.

May 19-21, Industrial Furnace Manufacturers' Association: Annual meeting, The Homestead, Hot Springs, Va. Association executive vice president is Stuart Clarkson, 420 Lexington Ave., New York.

May 20-21, International Acetylene Association: Annual convention, Hotel Gibson, Cincinnati. Association headquarters are at 30 E. 42nd St., New York.

May 21-22, American Iron & Steel Institute: 55th general meeting, Hotel Pierre and the Waldorf-Astoria, New York. Institute headquarters are at 350 Fifth Ave., New York 1.

May 21-24, American Society of Mechanical Engineers: 19th national conference on oil and gas power, Cleveland.

May 22-24, Automotive Engine Rebuilders Association: Silver anniversary convention at Hotel Statler, Detroit. R. G. Patterson, 415 N. Capitol Ave., Indianapolis, is association executive vice president.

May 22-31, Mid-America Exposition: Cleveland Public Auditorium; show of goods made and used in area bounded by Detroit and Buffalo, Cincinnati and Pittsburgh.

May 23-24, Institute of Metals Division, AIME: Boston regional conference, Hotel Sheraton, Boston. Conference chairman is H. I. Dixon, Sterling Alloys Inc., Boston.

May 26-27, Association of Iron & Steel Engineers: Annual Spring Conference, Benjamin Franklin Hotel, Philadelphia.

May 26-29, American Society of Mechanical Engineers: Aviation meeting, Los Angeles.

May 27, Metal Powder Association: Third annual spring meeting at Waldorf-Astoria Hotel, New York.

June 1-6, Society of Automotive Engineers: Summer meeting, French Lick Springs Hotel, French Lick, Ind.

June 2-4, American Gear Manufacturers Association: 31st annual meeting, The Homestead, Hot Springs, Va. Association executive secretary is Newbold C. Goin, Empire Building., Pittsburgh.

June 2-4, National Association of Purchasing Agents: Annual convention, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

June 5-7, Electric Metal Makers Guild Inc.: Fifteenth annual meeting, Hotel Roosevelt, Pittsburgh. Association president is J. F. Arthur, Box 6026, Mt. Washington Sta., Pittsburgh.

High Level Of Zinc Use To Continue

Speakers at American Zinc Institute's annual meeting at St. Louis foresee strong postwar demand for zinc

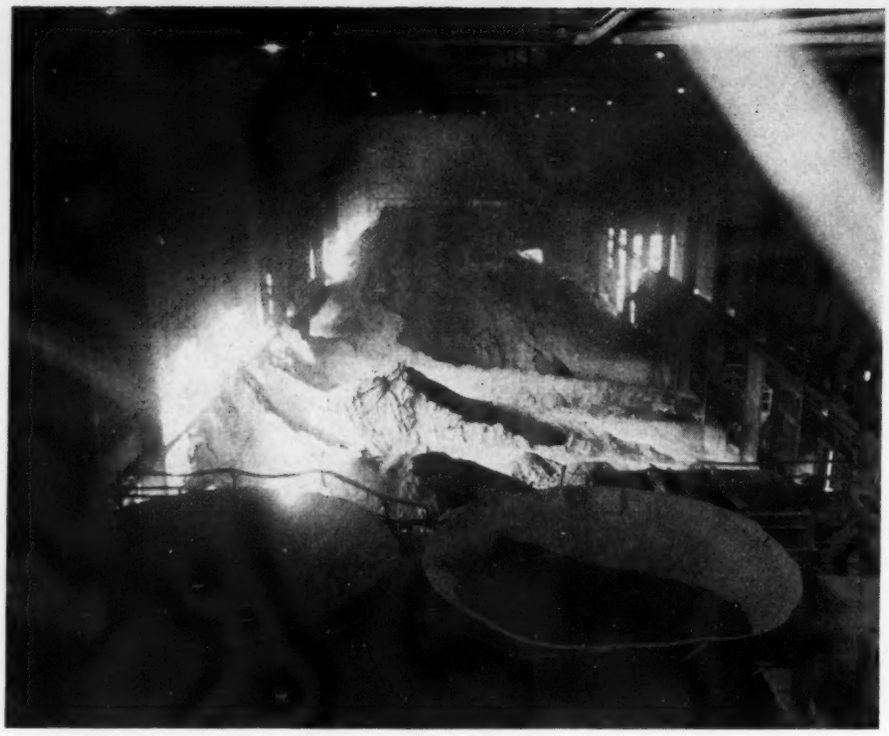
SUPPLY of galvanized sheets is far below demand and from present indications will continue so for some time, according to E. F. Lundeen, metallurgical engineer, Inland Steel Co., Chicago, speaking at the 29th annual meeting of the American Zinc Institute at Hotel Statler, St. Louis, April 28-29.

Mr. Lundeen, whose topic was "Market Outlook for Galvanized Sheets," emphasized, however, that contradictory forces in the demand-supply picture will have a marked influence on that product's future. Increasing competition from new materials is making inroads on traditional galvanized sheet applications. One such encroachment, he pointed out, is that of aluminum sheets in the roofing and siding market. Another competitor is plastic-coated cold-rolled sheets. Nonmetallic competitors have also sprung up. Composition roofing is one of these; asbestos cement board, as a substitute for galvanized sheet air conditioning and ventilating ducts, is another one.

Less Capacity Available

During the war, demand for galvanized sheets declined, with the result many producers closed their galvanizing departments. Currently, he stated, "seven plants that stopped galvanizing have not resumed, three have become captive plants with no galvanized sheets to sell, two are producing mostly for wholly owned fabricating plants and one is in restricted production, leaving eight plants to supply the existing demand. This situation occurs also at a time when uncoated sheets are in very great demand, which increases the difficulty in obtaining steel sheets to coat.

"In 1940, in round numbers, there were produced 1,700,000 tons of galvanized sheets. Last year the production was close to 1,350,000 tons, so that the fewer plants in operation are gradually taking up the slack," he explained. "The sheet galvanizing industry at the moment is consuming zinc at the rate of approximately 1¼,000 tons per year, which is equivalent to about 14½ per cent of the production of slab zinc."



Ore storage pile at Donora, Pa., Zinc Works of American Steel & Wire Co. Crude zinc ore is shipped here from the mines in box cars. In foreground can be seen two hoppers which feed the ore to rotary screens and driers below. The screens remove foreign matter and the driers condition the ore preparatory to roasting, which drives off the sulphur

Current supply of galvanized sheets, Mr. Lundeen said, is sufficient to supply only the roofing, farm, veterans housing and freight car building programs. In addition to these requirements are the pentup demands from the road building program, which needs quantities of galvanized culverts, and the demands of furnace manufacturers, whose 1947 needs are substantially above their 1946 requirements, to name a few.

Encouraging note in the future zinc supply situation was injected into the meeting by Thomas H. Miller, assistant director, Bureau of Mines, U. S. Department of the Interior, who spoke on "Zinc Metal Supply—Domestic and Foreign." On the basis of the bureau's partially estimated figures for 1946 world smelter production and world consumption of slab zinc (excluding Russia from whom information over the last several years has been unobtainable) a deficit of only 48,600 short tons was incurred. World production in 1947 and 1948 will exceed the 1946 output by an estimated 156,200 short tons and 350,200 short tons, respectively, he said.

"Market Outlook for Die Castings" was the title of a paper presented by David Laine, secretary, American Die Casting Institute, who declared the future picture depends entirely upon how much 99.99 zinc will be made available to the die casting industry. Shortage of this Special High Grade zinc, he said, is the industry's major problem and is forcing a switch to other metals which have suitable die casting applications.

The brass industry, another important consumer of zinc, was brought up for discussion by H. A. Schlieder, assistant to the president, Revere Copper & Brass Inc., New York, whose subject was the "Market Outlook for Brass."

This industry had a tremendous growth during the war, Mr. Schlieder stated, and its use of zinc zoomed correspondingly.

Postwar production, because of the different nature of peacetime brass products, has declined from the wartime levels, but recently has been running at about twice the average output of the prewar record years.

Currently the brass industry is not requiring the normal percentage of new metal because of the abundance of brass scrap. When this scrap has been absorbed, however, more copper and zinc will again be required to maintain the industry's production, he stated.

Included in the institute's program were addresses by the following: J. K. Richardson, manager, Utah Mining Association, who spoke on "Safety and Health in the Zinc Industry;" Theodore R. Sill, public relations expert, who stressed the need for management to "sell" workers on antistrike sentiment through intelligent public relations programs; and M. L. Havey, executive vice president, New Jersey Zinc Co., Franklin, N. J., who spoke on "Market Outlook for Zinc Pigments."

(*Please turn to Page* 176)

Pittsburgh Plus Abolition Held Factor Affecting Steel Supply

Speaker at Pressed Metal Institute meeting stresses effect of pricing change on steel distribution. Says shortage of sheets is attributable to combination of factors. Black market operations in steel discussed

R. C. TODD

WHEN Pittsburgh Plus pricing was finally abolished in the steel industry back in 1938, it was widely predicted that vast changes in the industrial map of the nation would necessarily follow.

Not immediately, perhaps, but, eventually, many manufacturers would find their steel supply sources tending to become increasingly restricted with transportation costs making steel sales distant from producing plants economically prohibitive or undesirable. Broad migration of industry, it was reasoned by observers, would be experienced as the impact of the change in steel marketing policy weakened the competitive position of many metalworking firms or seriously curtailed their steel supply sources.

Thorough testing of this theory was deferred by the war. With the free play of economic forces knocked out by government control of steel pricing and distribution, there was little chance for a clearcut demonstration of significant marketing changes in steel. With the ending of the war in 1945 and restoration of marketing policy to private industry, however, the predicted changes in the steel market began to become increasingly noticeable, and especially so in the flat-rolled steel products.

Causes Shortage of Sheets, Strip

Speaking at a regional meeting in Cleveland of the Pressed Metal Institute, Apr. 25, R. C. Todd, vice president, American Rolling Mill Co., Middletown, O., and a veteran of 45 years' selling experience in the steel industry, declared that a major influence in the tight sheet and strip supply situation now being experienced is the abolition of Pittsburgh Plus. Reluctance of steelmakers to absorb transportation charges unnecessarily is resulting in a scarcity of sheets at some points of consumption, he said, adding to consumers' supply difficulties attributable to the fact that at least 1 million tons of old handmill producing capacity has been dismantled and the further fact additional thousands of tons of sheets have been removed from the open market through acquisition of considerable producing capacity by fabricating interests which are diverting the product of these mills largely to their own uses.

Mr. Todd declared the steel industry is doing everything possible to keep sheets and strip flowing in volume to consumers. However, with demand far in excess of producers' ability to supply promptly, buyers necessarily must be satisfied with less tonnage than they actually can use. The steelmakers, he said, are allocating tonnage as equitably as possible, and he presented shipment data showing that the movement of sheets and strip in the various categories is close to prewar levels despite the elimination of certain facilities.

The steel industry, Mr. Todd said, has been under attack from all sides during these trying months of tight steel supply. It has been under pressure to reduce prices in the face of rising labor and raw material costs and has been blamed for abuses in the steel market arising from the operations of so-called black marketeers.

He denied the steelmakers had deliberately furnished the black market operators with tonnage but admitted his inability to explain how fly-by-night brokers got their hands on tonnage. His company, he said, had investigated complaints and had uncovered only a few irregularities. One instance, he cited, involved the hijacking of a truck-train of sheets, totaling about 53,000 lbs, being shipped to a legitimate customer. In this case neither the steel, the trailers nor the driver of the truck-train has been located yet. Reported diversion of government-allocated tonnage to housing had been investigated by government authorities, he said, and only minor infractions of the regulations were uncovered.

The speaker assured the pressed metal men that the steelmakers can be counted upon to do everything in their power to prevent the black market operators from getting tonnage and pledged co-operation of his company with consumers in any effort to correct irregularities in marketing. He cited comparative cost data showing that the increase in steel prices since 1941 has been much less than the increases in labor and raw material costs of the industry.

For some time past the Pressed Metal Institute has been waging a campaign against black market steel operators, and upon completion of Mr. Todd's address, Tom J. Smith, newly elected president of the institute, detailed the steps his organization has taken to correct supply conditions. He cited in considerable detail complaints of stampers, one of whom had been offered various tonnages of steel by black market operators, citing 8 specific instances. Many of these offers were by telephone and were turned down because the prices quoted were too high, the highest being $250 per ton, but the majority ranging from $160 to $210 per ton. Offers ranged from 5000 to 100,000 tons including cold-rolled, deep draw, and hot-rolled sheets.

Mr. Smith said the institute was continuing its campaign and was forwarding complaints to the American Iron & Steel Institute and government agencies.

Almost 200 stampers attended the one-day meeting, at which Mr. Smith, who had been executive vice president, was elected president. Other officers elected were: Vice president, Carter C. Higgins, vice president, Worcester Pressed Steel Co., Worcester, Mass.; secretary-treasurer, J. J. Boehm, president, the Boehm Pressed Steel Co., Cleveland. The Executive Committee includes in addition to Messrs. Higgins and Boehm, F. C. Greenhill, president, the Acklin Stamping Co., Toledo, O., C. W. Custer, president, the American Stamping Co., Cleveland, Harvey S. Johnson, vice president, Metal Specialty Co., Cincinnati.

Demonstrate Fog Landing Lights at Cleveland Airport

The bugaboo of the air transport lines, bad weather, promises to be licked by a new all-weather approach lighting system demonstrated for the first time last week at Cleveland Municipal Airport. Radar controls work well in bringing a plane up to the landing strip of an airport but cannot be depended upon in the actual landing operation. The new lights penetrate 1000 ft of the thickest fog, even in daytime. Thirty-six krypton-gas filled lamps are used, plus an equal number of neon blaze units, to light up the strip. The krypton lamps flash with a maximum brightness of 9 million candlepower per sq in., which compares with the sun's brightness of 1 million candlepower at the earth's surface.

U. S. Steel Corp. Shows Net Profit Of $39 Million for First Quarter

Net income amounts to 8.25 per cent of net sales. Corporation sets aside $15 million to help pay for increases in costs of expansion. Chairman Irving S. Olds sees possibility of holding the line on steel prices if favorable conditions prevail

STEADY AND HIGH rate of operations in the first quarter of 1947 enabled United States Steel Corp. to report for that period a net profit of $39,234,511. Highest quarterly net profit reported by the corporation in 1946 was $33,329,353 for the third quarter. Fourth quarter net profit was $31,215,636. In the strike-affected first quarter of 1946, net profit was only $10,238,271 and there would have been a net deficit had there not been created during the war years a fund to cover abnormal costs.

Of the $39,234,511 net income in the 1947 first quarter, $24,226,340 is being reinvested in the business, and the remainder, $15,008,171, is to be paid out in dividends. Fifteen million dollars is being earmarked for future expenditures for property additions, the amount of which, because of general increases in costs, will exceed previous expenditures for similar facilities.

Net sales in the first quarter of 1947 were $475,019,255, making the net income for that period 8.25 per cent of sales. Chairman Irving S. Olds pointed out that many companies earn more than that percentage. The corporation's net income was 9.8 per cent of investment, and, Mr. Olds said, that rate is not excessively high considering the approximately 100 per cent rate of operations of the corporation's subsidiaries.

Near-Capacity Output Sustained

Production of steel ingots and castings in the first quarter of 1947 averaged 97.9 per cent of rated capacity. Shipments of steel products in that period aggregated 4,843,674 net tons, compared with record peacetime high of 4,902,742 net tons moved in fourth quarter, 1946.

During the first quarter of 1947, the cost of additions to and betterments of facilities approximated $31 million. This heavy expenditure, to a large extent due to present-day costs being greatly in excess of prewar costs, is approximately $11 million greater than the amount recovered in the period through depreciation on facilities installed in earlier years at lower costs. At Mar. 31, 1947, the amount necessary to complete all authorized improvements and additions was approximately $284 million. The $15 million set aside to help cover increases in expansion costs is in addition to the $284 million, Mr. Olds explained.

Net current assets of the corporation and its subsidiaries at Mar. 31, 1947, after deducting current dividend declarations, were $616,589,167, compared with $629,078,938 at Dec. 31, 1946.

Average number of employees in the first quarter, 1947, was 275,961 and the total payroll was $199,675,743, compared with the fourth quarter, 1946, average of 276,237 employees and payroll of $195,746,115.

In his press conference following the regular quarterly directors' meeting last week, Mr. Olds saw sufficient demand ahead to warrant continued high operations for some time to come. Should these operations continue and should labor operate to its full ability, he said he hoped there would be no occasion for the corporation to advance steel prices, notwithstanding recent wage increases. Currently, he said, the corporation is producing steel ingots at the rate of 100.7 per cent, against a fraction more than 98 per cent in the preceding week. Unfilled orders are equivalent to about five months' production at the present rate of output.

However, he pointed out that present high rates cannot be expected to continue indefinitely, and that if there should be a drop in operations eventually to, say, possibly 65 or 70 per cent, "it will leave a question mark as to where we will be with respect to high labor costs." Business in steel, he said, reflects much the state of business generally and when things become slow generally they are bound to become slow in the steel industry. He thought the steel industry should be permitted to make enough money when times were good to take care of the periods when times are poor.

Asked about the current decline in scrap prices, Mr. Olds said it would not offset much the present increase in wage costs. He explained that considering its size the corporation did not buy much outside scrap.

The corporation's flow of tonnage abroad has been fairly constant for months at around 6 per cent of finished steel shipments.

Bethlehem's Earnings Set Dollar Record While Net Profit to Sales Lags Behind

WHILE Bethlehem Steel Corp.'s net earnings in first quarter this year were the largest in its history, they represented only 7.1 per cent on billings against 9.2 per cent for 1937, 7.8 per cent for 1939 and 9.3 per cent for 1940, Eugene G. Grace, chairman, reported to the stockholders recently.

Net billings for the period were $237,525,443 compared with $225,799,386 in the last quarter of 1946, and with $142,119,602 in the first quarter of last year.

Net income was $16,090,426 against $11,937,281 in the preceding three months and $4,804,438 in the like period of last year.

Mr. Grace estimated the corporation had orders for steel on hand equivalent to about four months' capacity production with little change from a few months ago; however, he said, "we will be looking for orders and glad to get them in the not too distant future."

Working capital of the corporation at the end of the first quarter was $303 million against $308 million three months previously; and cash, $244 million against $254 million.

Discussing the effect of higher costs on capital investment, Mr. Grace pointed out that the company, as of the beginning of the current quarter, had an expansion program of $143 million, and that as a result of present wage increases it will cost at least an additional $10 million. Incidentally, the corporation spent $63 million on expansion and improvements last year, and $23 million during the first quarter of this year. The management hopes to complete $100 million worth of expansion this year. Mr. Grace said that, generally speaking, the cost of expansion is today two or three times greater than in the average prewar year, with depreciation charges now up materially.

Orders on hand at the beginning of this quarter amounted to $400 million of which $82 million represented ship construction and repairs; three months previously total orders amounted to $429 million. Bookings in first quarter amounted to $208 million, against $238 million in the preceding three months.

Average hourly earnings of all employees for the first quarter amounted to $1.486 against $1.492 in the preceding quarter.

Bethlehem's payroll in the first quarter

amounted to $100,910,00, against $97,396,000 in the fourth quarter of 1946; number of employees was 140,352, against 140,655; weekly earnings, $55.91, against $52.70; and hours per week, 37.6, against 35.3.

Jones & Laughlin Steel Corp.

Jones & Laughlin Steel Corp., Pittsburgh, reported a net profit of $6,337,132 for the first quarter of 1947, a period in which it operated at an average rate of 95.8 per cent of its steel ingot capacity. In the first quarter, 1946, when the operating rate was only 54.5 per cent the net profit was only $813,246 after $4 million had been transferred from the contingency fund to income account to cover the approximate cost of the January-February steel strike. Fourth-quarter net profit in 1946 was $4,744,824, and for the entire year, $10,854,084.

Allegheny Ludlum Steel Corp.

Net profit of Allegheny Ludlum Steel Corp., Pittsburgh, for the first quarter of 1947 is reported as $1,829,609, up compared with the $252,043 in the first quarter of 1946 but down compared with net profit of $2,040,207 in the fourth quarter of 1946.

Curtailment of supplies of natural gas to industry during the cold weather of the first quarter of 1947 restricted Allegheny Ludlum operations and held down earnings in that period.

Keystone Steel & Wire Co.

A new high record net profit for a quarterly period was made by Keystone Steel & Wire Co., Peoria, Ill., in the quarter ended Mar. 31, 1947, the third quarter of the company's fiscal year.

Net profit for that quarter was $1,342,815, compared with the previous quarterly high record of $1,175,392 in the quarter ended Dec. 31, 1946. Net profit in the quarter ended Mar. 31, 1946, was $528,901. For the nine months ended Mar. 31, 1947, net profit aggregated $3,434,350, compared with $1,351,370 in the corresponding period a year earlier.

Inland Steel Co.

Net profit of Inland Steel Co., Chicago, in the first quarter of 1947 was $5,195,857, slightly below the net profit of $5,656,124 in the 1946 fourth quarter, the best quarter of the year.

For contingencies, the company in the first quarter of 1947 set aside $2,800,000.

Edward L. Ryerson, chairman, said earnings in the first quarter, 1947, were favorably affected by consumption of raw material inventories which had been purchased at prices substantially below those which will apply in the second quarter this year. The inventories have been replaced at the higher costs now prevailing, and consequently the net profit will be adversely affected in future months as these higher values are absorbed in costs, Mr. Ryerson pointed out.

Acme Steel Co.

Net profit of Acme Steel Co., Chicago, rose to $2,055,118 in the first quarter, 1947, compared with $679,329 in the corresponding period of 1946. For all 1946, net profit was $4,468,561.

Wheeling Steel Corp.

Wheeling Steel Corp., Wheeling, W. Va., reported its first quarter, 1947, net profit was $2,948,268, compared with $22,655 in the first quarter of 1946 which was marred by a steel strike. The corporation's net profit for all of 1946 was $5,372,910.

Interlake Iron Corp.

Increase in net income in the first quarter of 1947 over the corresponding period of 1946 is shown by Interlake Iron Corp., Cleveland. For the 1947 quarter, net income was $965,031, whereas net income for the first quarter of 1946 was $246,607.

National Steel Corp.

First quarter, 1947, net income of National Steel Corp., Pittsburgh, surpassed the net income of each of the quarters of 1946. The first quarter, 1947, net income was $7,325,058, compared with the largest 1946 quarterly net profit of $6,520,331 in the final quarter of that year.

Portsmouth Steel Corp.

Portsmouth Steel Corp., Portsmouth, O., had a net profit of $1,009,320 in the first quarter of 1947, making total net profit for its first nine months of operations $2,170,198.

Follansbee Steel Corp.

Follansbee Steel Corp., Pittsburgh, in the first quarter of 1947 showed a net profit of $500,849, slightly less than the net profit for the fourth quarter of 1946. Last year the company's net profit totaled $1,220,635.

Sharon Steel Corp.

Sharon Steel Corp.'s net profit for the first quarter of 1947 was $1,886,918, exceeding each of the quarters of 1946. Fourth quarter net profit was approximately $815,000, and total net profit for 1946 was $2,857,856.

American Rolling Mill Co.

The American Rolling Mill Co., Middletown, O., reported its net profit for the first quarter of 1947 as $5,918,876. Net profit for the fourth quarter of 1946 was $6,063,807, and total net profit for 1946 was $18,552,491.

Granite City Steel Co.

Granite City Steel Co., Granite City, Ill., has shown a net profit of $398,295 for the first quarter, 1947. For the fourth quarter of 1946, net profit was $716,061, while for the year there was a net loss of $481,696.

Standard Machine Tool Prices Show 3% Rise Since December

PRICES of standard machine tools, continuing the upward movement begun in April, 1946, rose during the first quarter of this year to 19 per cent above the level prevailing a year ago and to approximately 3 per cent above the December, 1946, prices, the Bureau of Labor Statistics recently reported.

Although prices rose during every month of the first quarter, the bulk of the increase took place in February. Leading the rise during the quarter was the price of horizontal type shapers, which increased approximately 11 per cent. Increases for boring mills, grinding machines and planers of approximately 5 per cent, and for automatic screw machines and turret lathes, of slightly over 2 per cent were noted. Quotations on radial and upright drills, engine lathes, milling machines and punch presses remained steady.

Since 1939, base period for the bureau's index, average prices for machine tools have increased 40 per cent. Broken down into types of machines, the price increases range from 25 per cent for automatic screw machines to 80 per cent for punch presses. Percentage increases since 1939 for the other standard tool types are as follows: Single spindle upright drills, 28; milling machines, 30; engine lathes, 31; vertical boring mills, 35; turret lathes, 36; grinding machines, 41; radial drills, 42; planers, 44; and horizontal type shapers, 53.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Commerce Department faces cut in appropriations which will necessitate pruning of many activities of dubious value. Contemplated steel market reports service likely to be victim of congressional economy move

NEXT important appropriation bill to come up for congressional action is that for the Department of Commerce. Rumor is that Commerce will get a cut of about 25 per cent in the House which, considering the large percentage of the Commerce appropriation that must be earmarked for the Civil Aeronautics Authority to be spent in development and safety work in the field of aviation, has given rise to speculation as to the amount of vacant space the department will have in its huge building at Fourteenth and Constitution after June 30. The net effect would be just as drastic as the 45 per cent cut the House decreed for the Interior Department.

Some spokesmen for business in Washington, as trade association executives who use Department of Commerce statistics and information, are wondering how much damage such a cut would do to the department's work. It is generally felt that it would be impossible to apply a cut of this magnitude without cutting into some essential services. A good example of what may happen when the economy axe is in operation was afforded when the House, due to a dispute as to the location of the projected $450,000 anthracite research laboratory of the Bureau of Mines, decided to delete the project entirely and save the money.

Economy Drive Largely Beneficial

However, anyone familiar with operations at Commerce will admit that the net effect of a sweeping economy drive there ought to be beneficial in the long run, for a good many chores of dubious value have been added from time to time and absorb the time and energies of a substantial number of employees in the high, low and medium salary echelons. Many examples could be cited; the one that will be discussed here is of particular interest to readers of STEEL, because it calls for a new Commerce service for the steel producing and consuming industries. It is a service which would duplicate that now rendered by private publishers, and rendered more comprehensively, perhaps, than would be possible in the Commerce Department.

The plan calls for the publication once a month, starting about the beginning of fiscal 1948, of iron and steel market reports. According to a letter of instruction to field men, they are to send in monthly letters dealing with all the factors that affect conditions in the iron and steel market—as availability of raw materials, labor conditions, price trends, consumption trends, expansion in consumption trends, expansion in consuming fields, conditions in iron and steel warehousing, the volume and character of export demand, etc.

Bearing in mind that the steel producing and consuming industries at present are served by publications which, like STEEL, come out weekly with reports blanketing all news, market and technical developments having a bearing on the production, fabrication and utilization of steel, it is of interest to note that the Commerce Department tells its field men that they are to send in their reports "not later than the 20th of the following month." Bearing in mind also the fact that stenographic and multigraphic work often runs weeks behind in the department, it is unlikely that the department's final, combined report could be prepared and released until at least a month had elapsed after the gathering of the information in the reports.

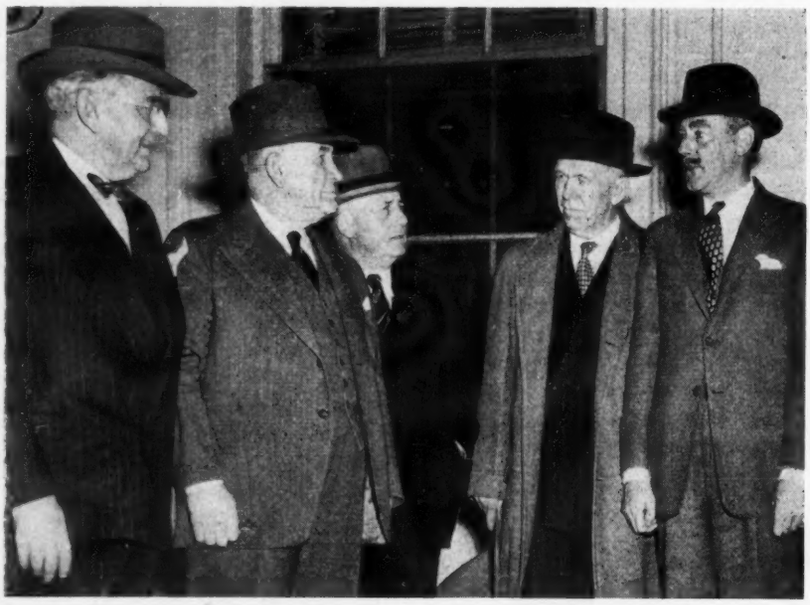
The contemplated activity of preparing and publishing of iron and steel market reports also would require manpower; how much cannot be determined offhand—but it could be considerable. As a starter, 14 field offices have been asked to report—those at Birmingham, Chicago, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, Salt Lake City and San Francisco. In addition to time spent by men in those offices in gathering and writing their reports, time also would be required by writers, stenographers, multigraphers and numerous others in the Washington office. And whether the Commerce Department, under the most favorable circumstances, could find experienced men to do this job, and give the reports real value, is a question that at least admits of argument.

The chances are that the Commerce appropriation for the next fiscal year will not permit of the addition of unneeded services such as the above.

More important, however, the reduction will force the department heads to challenge all present activities and retain only those that serve the public in essential ways. It is a foregone conclusion that many useless programs will become purge victims.

AFL Buys Headquarters Site

Lafayette Square, across Pennsylvania avenue from the White House, one of



MARSHALL REPORTS: Secretary of State George Marshall confers with administration and Congressional leaders on his return from the Moscow conference. Shown are, left to right: Sen. Arthur Vandenberg, chairman of the Senate Foreign Relations Committee; Senate Minority Leader Alben Barkley; House Minority Leader Sam Rayburn; Mr. Marshall; and Under Secretary of State Dean Acheson. NEA photo

these days might be rechristened fittingly as "Labor Square." Across the street on the west, at 718 Jackson Place, the Congress of Industrial Organizations has its headquarters. Now the American Federation of Labor has bought a site across from its northeast corner for a new headquarters building. Hard by, at 15th and I streets, is the famous United Mine Workers building in which John Lewis holds forth. And just around the corner, on 16th street, are the Carlton and Lafayette hotels in which union officials like to dine and hold powwows.

The land purchased by the AFL, for $1 million in cash, now is occupied by the historic 4-story Ashburton House at 1525 H street. It formerly served as the British Legation, and in it the Webster-Ashburton treaty settling United States-Canadian boundary differences was negotiated.

Of interest to many readers of STEEL is the fact that the last occupant of the Ashburton House was an heiress and descendant of the historic Freeman family which for many years operated blast furnaces based on the Cornwall iron ore bank in Pennsylvania. The daughter of Col. and Mrs. William C. Freeman and the widow of Navy Captain Benjamin H. Buckingham, she purchased the residence many years ago and occupied it until her death last October.

AFL directors have not decided when to start erection of a new building but it is expected to be fairly soon, for the organization has badly outgrown its present headquarters at 901 Massachusetts avenue, N. W.

Patent Decisions Studied

Thousands of businesses built up on patent ownership and patent licenses should be seriously concerned with the import of two recent Supreme Court decisions whose full significance only now is dawning on patent lawyers.

These decisions involve two classes of patents: Those whose use is covered by a license agreement containing a price-fixing clause, and those "improvement" patents which cover a new device for better utilization of existing devices.

In fact, some leading Washington patent attorneys now are advising clients to discontinue altogether the practice of writing price-fixing clauses into license agreements. They point out that the practice not only is dangerous, but that it is unnecessary to make use of price-fixing clauses. They point out that there are safer methods whereby the licensor may obtain compensation from a licensee.

Several years ago, these attorneys point out, the licensee in Sola Electric vs. Jefferson Electric sought to break the price-fixing clause in a patent agreement on the ground that the patent itself was invalid. The Supreme Court ruled that the case involved a public policy consideration which over-rode the old principle of estoppel under which a licensee was prohibited from attacking the validity of the patent covered in his license. As a result of this decision, licensees since have been free to attack the validity of patents involved in license agreements containing a price-fixing clause.

However, the decision also raised some uncertainties which now have been resolved as a result of the Supreme Court's decision in January of this year in two identical cases—Katzinger vs. Chicago Metallic and MacGregor vs. Westinghouse Electric. These cases did not involve suits for enforcement of price-fixing clauses; instead, the complainants sued for payment of royalties and damages for infringement. The Supreme Court decided that the principle established in Sola vs. Jefferson applied also in these two cases, namely: When the license agreement contains a price-fixing clause the licensee is free to attack the validity of the patent.

Other Reimbursements Advised

So patent attorneys believe, in the light of these decisions, that a licensor is on dangerous ground when he relies on a price-fixing clause to compensate him for the use of his patent. He should employ some other method of obtaining payment, such as stipulating a lump-sum payment for the use of the patent, or arranging for the payment of adequate royalties.

This new view of patent attorneys is strengthened by the persistence of the Department of Justice in seeking to outlaw entirely the use of price-fixing clauses in patent license agreements. It has carried the case of United States vs. The Line Material Co. to the Supreme Court and hopes to get a decision before the end of the present term. In this case the Justice Department seeks to override the famous decision in the General Electric case of 1926 which upheld the right of the patent owner to fix the prices charged by his licensees under his product's patent. At the least it hopes to get a clarification that will define the price-fixing rights of the licensors.

The other recent decision of vital importance to many manufacturers is that of the Supreme Court in November of 1946 in the case of Halliburton vs. Walker. Some Washington patent attorneys say bluntly that it threatens the legality of thousands of socalled "improvement" patents; that is, patents on inventions which permit more beneficial use of existing inventions. In the Halliburton vs. Walker case the Supreme Court threw out a patent on a new device for obtaining improved performance with acoustical depth indicators used in drilling oil wells.

The court held that while Walker had added one new element to a combination of old elements, the patentability of the new element had not been supported by a sufficiently particularized description. The application, the court said, laid stress on what the improved combination would do. Instead, it should have described in detail the structural composition of the crucial new element, as well as the physical means by which it was used in combination with existing apparatus. Further, the court held, the invention was not sufficiently broad to support the broad claims advanced for it.

The patent attorney of an internationally famous corporation, whose business depends to a large extent on the validity of its patents and those under which it is licensed, says that the Halliburton vs. Walker decision raises these questions to perplex the patent application writing fraternity:

1—How shall "means" claims—that is, claims describing the means of accomplishing certain results to be derived from the use of the invention—be worded so as to stand up in litigation?

2—How shall "combination" claims—that is, claims describing a newly invented device which is to be used in combination with existing elements—be worded so as to meet the court's tests?

"The big question now," he said, "is: How will the courts interpret the scope of claims of these types? Who is infringing and who is not infringing?

"As a patent attorney," he continued, "I feel the important feature is that in the Halliburton vs. Walker decision the Supreme Court seems to say that it is looking at these claims from the point of view of public policy, and that it will not countenance claims covering inventions not yet made."

The Halliburton vs. Walker decision has added a new headache for the Patent Office by injecting these fresh complications into the always difficult task of passing on patent application wording. The Patent Office is studying the decision and proposes to revise present instructions to its examiners.

Conventions at Capital

Hotel space in Washington, tight since the middle of March, will continue that way through June 15, and prospective visitors to the national capital should enter reservations to be on the safe side. After that, except for the last week in June, no more congestion is expected until next October.

Reason for the present pressure is the re-establishment of Washington as the host for numerous annual conventions.

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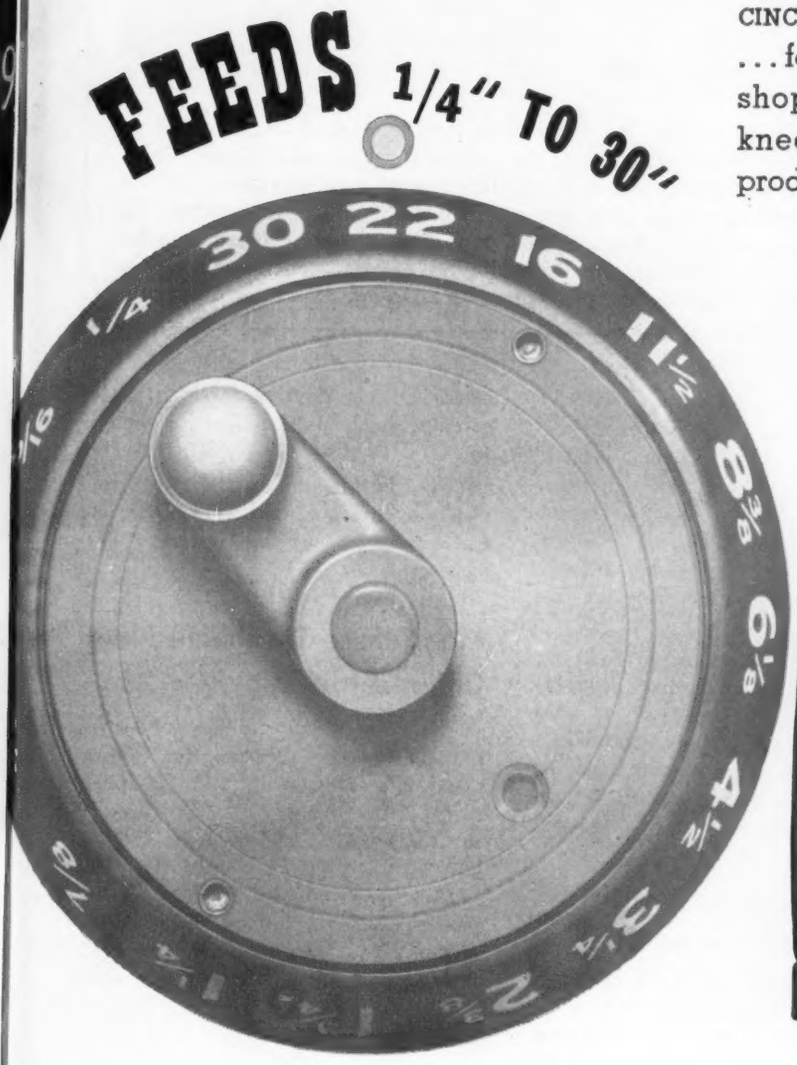

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Refinancing of Fontana Steel Plant Sought

Kaiser interests plan to push campaign for capital investment reduction and lower freight rates

THE KAISER Co., which has placed on file with the Western States Steel Council all records and books pertaining to its Fontana plant operation, plans to push its campaign for a reduction in capital investment and for lower freight rates which, it is asserted, will place it in a more competitive position in relation to the Geneva, Utah, steel mill.

With the support of the council, members of which are the chief steel consumers in all western states, Kaiser will ask for refinancing on the basis of the postwar rather than the wartime dollar value.

This is interpreted to mean that a proposal will be made to RFC for prorating of capital investment at Fontana totaling $95 million. The ratio would be in proportion to the discounting of the price of the Geneva mill, which, costing the government $200 million, was sold to United States Steel Corp. for an overall figure of about 40 cents on the dollar.

WEST'S NEWEST MILL: The $25 million steel sheet and tin plate mill of Columbia Steel Co. takes shape on the industrial skyline of Pittsburg, Calif. Scene above shows lifting of a 9-ton, 120-ft steel truss into place on the tin plate warehouse, one of a group of buildings which will enclose 25 acres of floor space and house 12,500 tons of machinery. Upon completion of these new facilities, this United States Steel subsidiary will supply approximately 500,000 tons of sheet and tin plate to western industry

Big Steel Demand Seen in California Bridge Program

An active market for steel is seen assured in plans of California highway officials to construct a large number of bridges throughout the state during the next few years.

During the war when labor and materials were scarce many highway bridges could not be kept in condition under the heavy traffic. A report of the California Division of Highways shows that of 11,600 bridges on county roads, 5261 are inadequate and need early replacement because of structural weaknesses.

By the beginning of this summer first construction on this rehabilitation program will be under way. Plans have been drawn for building 55 new bridges on country roads in the state at a cost of about $5,575,000.

California Plastics Trade Shows Postwar Shrinkage

Competition of plastics products with items made from steel and other metals is fading on the West Coast, a survey of plastics fabricating firms shows.

Production volume of plastics makers, which expanded sharply during the war, has been shrinking steadily in recent months. In southern California, where a large part of the West Coast industry is concentrated, operations now are less than a third of capacity.

This shrinkage stems largely from the fact plastics production was over-expanded during the war years when metals were scarce. Now that articles made from metal are coming back on the market, the buying public is turning again to metal articles.

Willys California Plant To Build 100 Jeeps Daily

Willys-Overland's southern California assembly plant at Maywood, Calif., will be in production at the rate of 100 jeeps a day by July 1, it was announced last week.

Industrial Investments in Los Angeles County Double

Erection of new plants and investments in industrial expansions in Los Angeles county in March nearly doubled the record of the previous month, the Los Angeles Chamber of Commerce reports. Nearly $10 million was invested in industrial plants during March, as compared with about $5 million for February.

In the first quarter of 1947, industrial plant investments reached $21,668,500. There were 56 new factories and 93 expansions.

Manganese Treatment Plant Offered for Sale June 25

The War Assets Administration has put up for sale or lease, the government-built manganese ore treatment plant at Las Vegas, Nev., with June 25 set for closing date of bids. Original cost of the plant was more than $7.5 million. The property includes a manganese oxide preparation plant, beneficiation plants with 1000-ton daily crude ore capacity, and a deposit of about 3,423,000 tons of ore of 15 per cent manganese content.

Firm Formed To Develop Copper Land in Arizona

Formation of a new company, the Amico Mining Corp., for the purpose of exploring undeveloped land in Gila County, Arizona, has been announced by Anaconda Copper Mining Co., Inspiration Consolidated Copper Co., both of New York, and Miami Copper Co., Wilmington, Del.

Production of Iron Ore in New Jersey Again Seen on Uptrend

Mining operations scheduled to be resumed June 1 at property recently acquired from government by H. P. Moran. Inactive since early 30s. Labor shortage prevented working in war years. Owner counting on 300,000 tons annual output

SCHEDULED opening of operations at the Ringwood mines in the Highland section of northern New Jersey by June 1 is expected to reverse the trend of iron ore production in that state, which has been steadily downward, even throughout the war years, from a peak of 659,425 long tons in 1940, to an estimated 417,000 in 1946.

It is believed that the new activity at Ringwood might increase output this year by as much as 100,000 tons.

The Ringwood property, comprising 878 acres, and which has been down since the early 30s, was acquired by the government in 1941 at a cost of $3,028,404, and after extensive improvements was recently sold by the War Assets Administration for $1,297,000 to H. P. Moran, 55 Liberty street, New York City, who will operate the property under Ringwood Mines Inc.

Property Not Worked During War

It was the intention of the government to get the property in shape for production by July 1, 1943, with the Alan Wood Steel Co., Conshohocken, Pa., to operate the mines on a fee basis. The mines were de-watered and rehabilitated in general and a new wet mill was finally completed—a mill that would process martite (a relatively small portion of the ore mined in the state) as well as magnetite. These expenditures brought the total cost of the property to the government up to close to $4 million. However, due to shortage of labor, difficulty in getting equipment and other handicaps, the property was not put into operation during the war—nor since.

While at one time it was estimated that the property was good for 200,000 to 225,000 gross tons of crude ore, it is understood that the new owner is counting on an output of 300,000 tons per year, once operations get into full swing —a rate that could be sustained, it is estimated, under favorable market conditions for a period of at least 10 years.

Hence, the estimate of 100,000 tons output at this property before the year is over is regarded as reasonably conservative.

With preliminary estimates of iron ore production for last year as 417,000 long tons, an output of well more than 500,000 tons appears in prospect, and especially in view of the likelihood of continued good demand over the remainder of the year, and, of primary importance, a better supply of labor.

In fact, it was labor shortage that was primarily responsible for the decline in New Jersey ore production during the war when actually it was most needed.

From the peak of 659,425 long tons in 1940, iron ore output dropped to 649,374 in 1941; to 604,051 in 1942; to 520,691 in 1943; to 499,732 in 1944; to 430,302 in 1945; and to the tentative figure of 417,000 last year. The decline during the war years due principally to labor shortages is explained by the fact that much of the New Jersey ore is mined in and around Dover, N. J., near the Picatinny arsenal, with the mine labor therefore particularly attracted by the substantially higher wages that were being paid at the arsenal. Under wartime regulations it was not possible for the mine operators to increase wages sufficiently to compete with the scale permitted in the ordnance plants, it is pointed out.

Further pointing to higher output in the New Jersey ore mines this year is the likelihood that the Washington mine, Oxford, N. J., will again get into commercial operation soon. The Alan Wood Steel Co., which owns the property, has been further developing it and expects to step up output as fast as it can obtain the available help. This, however, still may be a somewhat slow process. Alan Wood also owns the Scrub Oak mine, which is the largest in the state, and has been engaged in further prospecting there. Both the Scrub Oak and Washington mines were purchased a few years ago from the Warren Foundry & Pipe Co., Phillipsburg, N. J., although Alan Wood had been operating these mines under lease since late in 1929. Acquisition of these properties at that time placed Alan Wood second only to the Bethlehem Steel Co. among the completely integrated iron and steel companies along the eastern seaboard.

The Mt. Hope mine, owned by the Warren Foundry & Pipe Co., continues with its development work and some new drilling is being carried on at the Richard mine, Wharton, N. J., by the Richard Ore Co., subsidiary of E. & G. Brooke Iron Co., Birdsboro, Pa., which acquired the property a few years ago from the Thomas Iron Co. However, while there has been considerable activity at the New Jersey ore properties over the past six years or so no new mines have been opened.

New Jersey ore reserves, it is estimated, contain about 600 million tons of magnetite, with an iron ore content of 40 to 60 per cent. New York state's reserves, incidentally, are estimated at 900 million tons of magnetite and it has been calculated that the reserves of the two states combined are sufficient to yield by proper concentration approximately 1 billion tons of 67 per cent concentrates. However, it is admitted that such estimates can only be guesses at best.

For the record, iron mining in New Jersey began in 1710, with production expanding steadily until the early 80s of the last century. Then, with the opening of the Lake Superior deposits, a decline set in, which reached particularly low ebb in the 5-year period, 1931-1935 inclusive.

Declares U.S.-Owned Nickel Facilities in Cuba as Surplus

Reconstruction Finance Corp. has declared surplus the government-owned nickel mining and processing facilities installed in Cuba as a war measure, at an approximate cost of $35 million.

The plant was designed to treat approximately 5000 tons of wet nickel ore per day, and to produce 2,666,666 pounds per month of contained nickel, in the form of nickel oxide. The nickel mines themselves are owned by Nicaro Nickel Co., which is controlled jointly by Freeport Sulphur Co. and RFC.

It is planned to dispose of the facilities through War Assets Administration on a basis that will assure continued operation of both the mines and the facilities, for production of nickel oxide, recently introduced into the steel industry, reports RFC.

Rail Executive Optimistic On Business Prospects

"There is enough demand for steel alone to insure fair employment for a long time to come and if a recession comes it will be in dollars, not in jobs," said R. L. Williams, president of the Chicago & North Western Railway Co., in Los Angeles last week.

Mr. Williams said the railroads and automobile builders have on order a tremendous amount of steel. Other heavy industries are likewise committed to unprecedented buying programs. With such activity in basic industries, he declared, there cannot be a major depression for some time.

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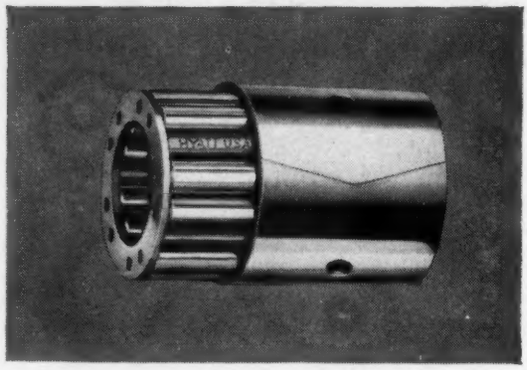

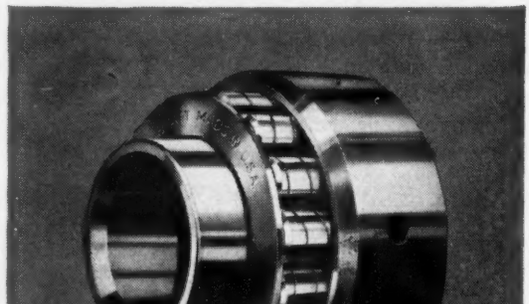

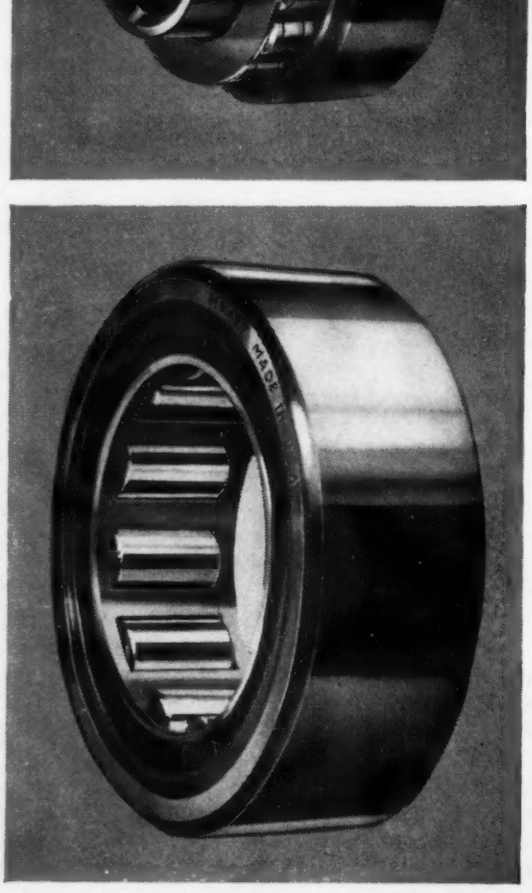

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ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Henry Ford II cites misunderstanding of public regarding corporate earnings as argument for informing people of economic facts of life. Says industry's failure in handling human relations invites greater government regulation

DETROIT

HENRY FORD II told the Chamber of Commerce of the United States a better understanding of the economic facts of life is needed to make the private enterprise system work without labor-management friction.

For example, 60 per cent of the American people were shown by a recent poll as believing that corporations make 25 per cent or more profit a year; actually, in the 15 years 1925-1940 the profit margin was 3.2 per cent for all manufacturing corporations, he said.

Surveys show that 75 per cent of industry's employees think the stockholders and top management of corporations take more out of the business than employees do when, actually, the employees get almost 6 times as much as the amount paid to stockholders and the amount reinvested in the business. As to share paid to "top management," said Mr. Ford, the compensation of all corporations in 1931-1941 amounted to 2.3 per cent of sales, whereas officers of large corporations—those with assets of $50,000,000 or more—get only one-half of 1 per cent of total income from sales.

Workers' Viewpoints Asked

Facts such as these, he declared, should be communicated by industry to all employees and to the public at large.

"We recently sent out a questionnaire to everyone who works for the Ford Motor Co. More than 22,000 of our people took the trouble to fill out the questionnaire. They had some very interesting things to say. Thirty-nine per cent of them feel that the policies of our company have never been explained to them. More than one-third have the impression that no effort is being made to make them feel a part of the Ford Motor Co. More than half of them think that there should be some systematic way by which they could make their views known directly to us. Sixty-two per cent think that questionnaires and polls of this kind are a good thing because they give them a chance to express their views."

Failure by industry to handle its "human relations" problems adequately, said Mr. Ford, will invite more governmental regulation of business for "when people feel that things are not going right, they turn to government."

K-F Loses $19 Million

Kaiser-Frazer Corp. reported consolidated net loss for 1946 of $19,284,680. The loss, according to the annual report to stockholders, includes all the expenses for engineering, design and preparation for production of automobiles. None of the expenses was deferred.

Chairman Henry J. Kaiser and President Joseph W. Frazer, who signed the report, said "last year was primarily a period during which the corporation was entering the automobile manufacturing business, rather than a period of production in volume from which profitable operations could be expected."

Edgar F. Kaiser, vice president and general manager, said the company had increased production in April to a level which should put the firm on a profitable operating basis. The company expected to turn out 8000 cars in April, compared with 1130 last September, 4089 in November, 7141 in January. Since June, 1946, when the company began operations, 37,500 cars have been produced.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	442,242	140,738
April	446,000	248,108
May		247,620
June		216,637
July		331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 mos.		3,268,456
Estimates for week ended:		
April 12	97,893	50,425
April 19	105,337	58,565
April 26	100,675	64,559
May 3	107,000	67,060

Replacement Parts in Demand

The vast job of restoring the nation's automotive transportation equipment to a condition comparable with that of prewar days is providing manufacturers of replacement parts with a huge task, one that in 1947 alone is expected to roll in $2 billion.

In 1946, the replacement parts volume totaled $1,750,000,000, and in the trade there is strong belief that this figure may be exceeded by 15 per cent in 1947.

However, the currently common problem of obtaining sufficient supplies of raw materials is, of course, a handicap. Even though the need for repair parts for passenger cars, trucks and busses is urgent, the replacement parts makers must wait for materials and components, for it is impossible for those manufacturers to surmount a problem that is still a stumbling block for producers of original equipment.

In addition to the replacement parts makers, the automobile manufacturers are contributing substantially to the restoration of the nation's automotive equipment. For example, in 1946, General Motors passenger car and truck producing divisions furnished around 185,000 engines and stripped cylinder blocks for field repairs. Of these, more than 33,000 were for trucks and the rest for passenger cars.

Also, Ford sold a few new units in 1946 for replacement purposes, and authorized Ford shops throughout the United States rebuilt about 350,000 power plants for cars and trucks owned by companies.

Chrysler's contribution was the delivery to service stations of around 250,000 reinstallation engines in 1946.

Other makers of cars and trucks are observed as having made proportionate trade shipments, making what Ward's Automotive Reports estimates as in excess of one million for the entire industry.

Of academic interest is the question how many sales of new cars were evaporated by the rejuvenation of old cars through installation of replacement engines.

Ferguson Suspends

Harry Ferguson Inc., tractor and implement manufacturer formerly associ-

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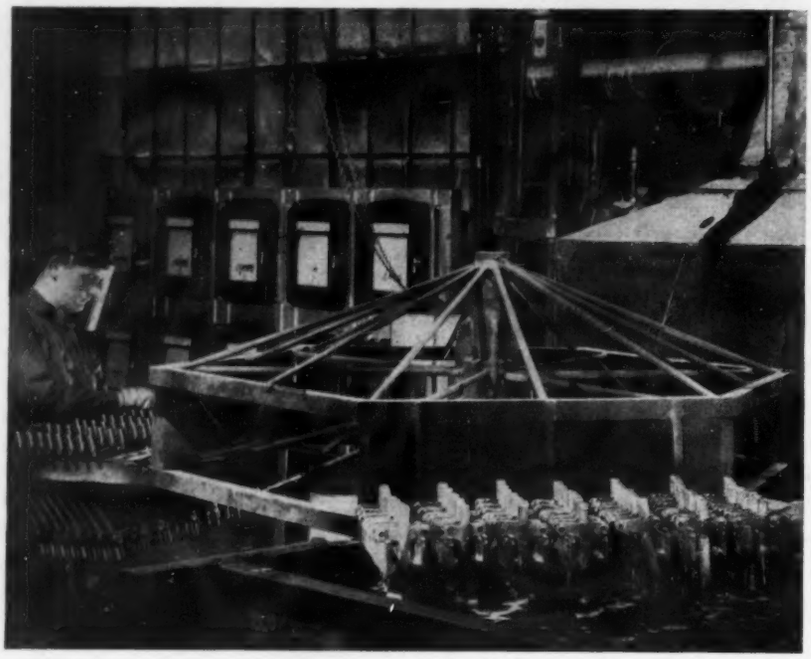


HOME-MADE HEAT TREATING EQUIPMENT: Unable to get delivery on automatic cyanide heat treating equipment when it reconverted to automobiles, Studebaker Corp. built its own fixture and now likes the substitute so well that a duplicate has been authorized. The process employs a 6-sided merry-go-round with space between three racks. As one rack is being loaded, parts in the second rack are subject to the cyanide bath while parts on a third are quenched in oil. Studebaker metallurgists favor the home-made fixture because they believe it more trouble-proof and less expensive than an automatic system

ated with Ford but recently divorced from the motor company, last week suspended operations in Cleveland where the company was preparing to start production in the former Pneumatic Aerol plant. Suspension was ascribed to the uncertainty of stock market conditions, which prevented the company from floating an $8 million stock issue.

About 90 officials of the company had moved to Cleveland from Detroit after Ferguson and Ford severed relations. Originally, they expected to produce 1000 tractors a day in the Ohio metropolis.

In February, Ferguson bought the Pneumatic Aerol plant from the War Assets Administration, and paid $1,900,000 in cash for it. WAA officials pointed out that the company could have paid only $470,000 down on the plant at the time of purchase and paid the remainder over a 10-year period. However, at the time, Ferguson officials said they were assured that $8 million operating capital would be forthcoming. Current talk of recession was blamed for the inability to raise the capital at this time.

Studebaker in Black

Studebaker Corp. reported consolidated net income of $1,655,760 for the first quarter of 1946. This was equivalent to 70 cents per common share and compares with a net loss of $129,760 in the first quarter of 1946.

Net sales in the first three months of 1947 totaled $62,322,216, compared with $25,135,700 in the corresponding period last year. Studebaker sold 47,470 passenger cars and trucks during the quarter, almost double the 24,341 units sold in the comparable 1946 period.

GM To Build Foundry

Central Foundry Division, General Motors Corp., Detroit, has been granted approval by the Facilities Review Committee of the Office of the Housing Expediter for building a foundry at Defiance, O. Approval for construction of the $1,900,000 foundry to be used for producing gray iron castings was based on increasing production of an item in short supply.

Ford Seeks Leadership

Speaking informally at the National Press Club in Washington last week Henry Ford II said his chief aim is to beat Chevrolet. The Ford company, he said, is now operating at only about 85 per cent of capacity and even that isn't enough to meet the demand. As far as Ford is concerned, however, the buyers' market can't come too soon. He said there is no mystery about what the Ford company is trying to achieve. It wants to again take the leadership in the low-priced automobile field. It conceded it was going to be a "helluva" job.

Writes Memoirs of Auto Industry

Latest saga of the motor industry is Eugene W. Lewis' *Motor Memories*, published Apr. 21 by Alved of Detroit Inc., a 312-page commentary on the history of the automobile as recalled by a man who for 20 years prior to 1917 was closely associated with automotive development as sales manager for Timken Roller Bearing Co., and who for the past 30 years has been president of the Industrial National Bank of Detroit. His memorabilia deal with the early days of the "horseless carriage," biographical detail on the great and near-great who brought the industry to its present eminence, reflections on the important role played by partsmakers and body builders, along with factual data and dates marking the industry's milestones.

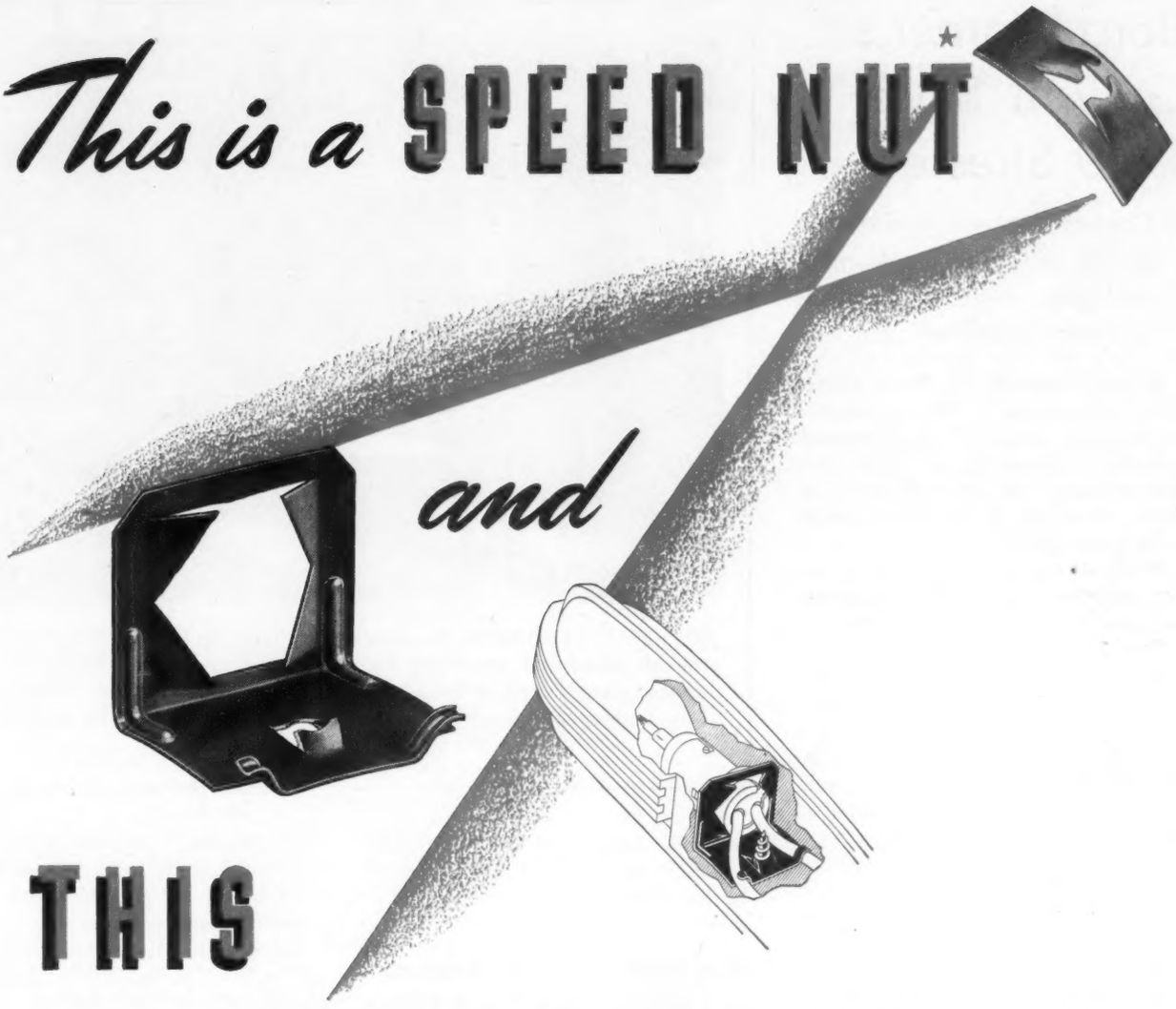
Mr. Lewis' work is an important contribution to automotive literature. The critical reader will enjoy the hundreds of behind-the-scenes incidents occurring over the past 50 years to which the author must have been an eye-witness on many occasions.

New Foundry Technique

A new technique in the foundry field, currently being experimented with by Buick and Cadillac, involves use of chemically treated molding sand to eliminate the need for sea coal and binders and to produce a superior finish on the casting. A carbonaceous coating is applied to the sand in the mixer and is replenished as the sand is reused. The coating covers each individual sand grain and has sufficient plasticity to serve as a binder. The process originated in the Detroit area, although much of the early experimental work has been done at Lynchburg Foundry Co., Lynchburg, Va.

The Cadillac installation is on a small parts line, and some of the first castings produced are reported to come from the sand with a finish that resembles a shot-blasted surface. Thus far the process has been confined to mold sands, but work is now progressing on extending the treatment to core sand as well. Automotive foundrymen are considerably enthused over the prospects for the method on a wide range of gray iron castings.

This is a SPEED NUT*



and

THIS

..is also a Speed Nut!

Take a look at this *one* SPEED NUT that does *three* jobs. Conceived by our development engineers to simplify automotive parking lamp assembly, it retains light socket, spaces wires and fastens entire assembly to the base. (See sketch). It replaced four separate parts and eliminated three machining and welding operations.

This is but a typical example of the SPEED NUT Savings Factor. So flexible is the basic SPEED NUT principle, it can be incorporated in almost any conceivable shape to improve your product, speed up your assembly, reduce the number of parts and cut costs. We can give you a no-charge fastening analysis that may surprise you. Send in your assembly details today.

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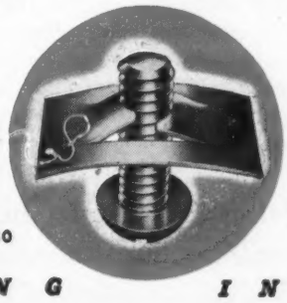

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MORE THAN 4000 SHAPES AND SIZES

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FASTEST THING IN FASTENINGS

Borg-Warner's Growth Since 1940 Stressed

Company's president cites new plants, increased employment and sales, and new products in depicting expansion

STEADY growth of Borg-Warner Corp., Chicago, since 1940, as reflected by its greatly expanded plant capacity, increased employment and sales, and new products, was depicted by C. S. Davis, president, at the firm's annual meeting recently.

Bases of the comparisons were the company's first quarter, 1947, report and the report for the first quarter, 1940.

Employment jumped from 11,346 in 1940 to 21,643 on March 31, 1947. Sales volume of $59,445,045 in the first quarter of 1947 is compared with volume in the comparable period of 1940 of $20,575,336. Net income in the first three months of 1947 was $4,684,481 against $1,776,240 in the same period of 1940.

Growth in facilities was emphasized by Mr. Davis' listing of plants which have been acquired since 1940. The Franklin, Pa., steelworks, now being purchased as a B-W division, and the erection of an additional Mechanics Universal Joint Division plant at Memphis, Tenn., brings to ten the number of new plants added since that date.

Eight Other Plants Added

The other comparatively new facilities are: Ingersoll Steel Division's plant at Evansville, Ind.; Norge Division's plants at Chattanooga, Tenn., Herrin and Effingham, Ill.; the Superior Sheet Steel Division plant at Canton, O.; the Wisconsin Transmission Division plant at Milwaukee; Warner Gear Division's plant No. 4 at Muncie, Ind.; and Borg & Beck Division's plant in Chicago.

"A carefully laid program of diversified manufacturing is responsible in large part for our corporate growth," Mr. Davis stated.

"The corporation was formed in May, 1928," he added, "and at that time the operations were conducted by four substantial manufacturers in the automotive field—Borg & Beck of Chicago, Warner Gear of Muncie, Ind., Marvel Carburetor of Flint, Mich., and Mechanics Universal Joint of Rockford, Ill. Upon this solid foundation we built a diversified manufacturing operation that now produces durable goods not only for the automobile manufacturers but also for such varied industries as the farm implement makers, the home builders, the household appliance field, aviation and many other industrial enterprises."

NEW STANLEY PLANT: This new 6-story building in New Britain, Conn., provides additional space for the manufacturing and assembling of the portable electric tools in the Stanley Electric Tool and Stanley-Carter lines of the Stanley Works. General offices of the company are located on the street floor of the building

Projected Plant Expansions In 1947 To Cost $13.9 Billion

Construction of new plants and purchase of new equipment during 1947 is expected to cost about $13.9 billion, according to a survey made jointly by the Securities & Exchange Commission and the Department of Commerce. In 1946 such expenditures amounted to $12 billion and in 1945 to $6 billion.

If the projected expenditures are made, they will be about 70 per cent above the amounts spent in 1941 and more than 50 per cent higher than in 1929, the two prewar highs. Adjustment for price increases which have occurred since 1946, however, will bring the value of the projected additions to slightly less than the 1946 figure, the survey indicated.

Manufacturing companies expect to spend about $6.2 billion this year for their expansions, and indicate a gradual tapering off throughout the year. Railroads, electric and gas utilities, however, anticipate continued increases in their expenditures throughout the year.

Union Carbide To Increase Facilities Substantially

New plant construction by Union Carbide & Carbon Corp., New York, will cost the company between $60 million and $70 million and possibly a little more if needed construction materials are obtainable, Fred H. Haggerson, president, said at the firm's annual meeting recently.

This amount will compare with $50 million spent in 1946, more than half of which was for chemical and plastics facilities. It is about twice as large as Union's average annual construction expenditure for the last ten years.

Estimating first quarter earnings at a little more than $2 a share, Mr. Haggerson reported: "We have not seen any sign of the falling off of demand and from present indications we expect sales and profits this year will be in excess of 1946."

Iron Powder To Be Made In Painesville, O., Plant

Commercial production of iron powder by a new process will begin soon at the recently constructed plant of Buel Metals Co. in Painesville, O. The Buel company, which was formed by Butler Bros., Cooley, Minn., developers of the method, is currently installing machinery in the 74 x 242-ft plant.

Experimentation on the new process has been under way for several years and a pilot plant at Cooley has been improving the process until it is now commercially feasible. The pilot plant will be closed and its equipment transferred to Painesville.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Scovill Mfg. Co., Waterbury, Conn., has awarded a $2 million contract for an addition to its rolling mill to Turner Construction Co., New York. The addition will house equipment for cold rolling copper alloys in sheet and strip form.

—o—

Oliver Corp., Chicago, is to begin construction immediately of a 100,000 sq ft addition to its wheel-type tractor plant at Charles City, Iowa. Expected to increase capacity 25 per cent, the addition is a major step toward an annual tractor production goal of 25,000 units here.

—o—

North American Smelting Co., Philadelphia, has purchased for $272,000 the government surplus plant in Wilmington, Del., formerly occupied by Nicaro Nickel Co.

—o—

Ziegler Steel Service Co., Los Angeles, warehouse firm, has moved to its new warehouse at 7022 Telegraph Rd.

—o—

North American Philips Co. Inc., New York, manufacturer of radio components, x-ray equipment and other products, has named as agents Dan J. Connors Co., Philadelphia, for New Jersey, Delaware, Maryland and eastern Pennsylvania; and Harold J. Kittleson, Los Angeles, for the southern California area.

—o—

Southern States Iron Roofing Co., Savannah, Ga., manufacturer of building supplies, has opened a warehouse in Nashville, Tenn.

—o—

Interchemical Corp., New York, announces that Roxalin Flexible Finishes Inc., Elizabeth, N. J., has been integrated with its Finishes Division. Roxalin's line of finishes for wood and metal will be continued.

—o—

Pennsylvania Salt Mfg. Co., Philadelphia, manufacturer of corrosion proof cements and paints, has opened a new plant at Natrona, Pa., which will double the firm's production of cement.

—o—

Titeflex Inc., Newark, N. J., manufacturer of flexible metal tubing, filtration equipment and radio products, has enlarged and moved its export department to its main office.

—o—

Pennsylvania Transformer Co., Pittsburgh, manufacturer of all types of transformers, has leased for five years building No. 30 of the $8 million war plant at Canonsburg, Pa. To pay an annual rental of $10,018, the firm already leases two other parts of the plant which during the war was operated by Aluminum Co. of America.

—o—

Chesapeake & Ohio Railway, Cleveland, shattered all existing daily coal loading records with the loading of 5736 cars on April 24. Previous high was 5654, loaded last January.

—o—

International Nickel Co. Inc., New York, will extend its program for fellowship awards in Canada, Great Britain and the United States. In the United States six two-year fellowships will be granted biannually over a period of twelve years at Massachusetts Institute of Technology, Carnegie Institute of Technology, Yale University, University of Michigan, University of Illinois and Johns Hopkins University.

—o—

Lehigh Foundries Inc., Easton, Pa., has leased for 10 years a government-surplus foundry at Easton which it operated during the war. Terms of the lease call for a rental of $6.50 per ton of castings production with a minimum guarantee of $50,000 a year. The agreement carries an option to buy for $624,000.

—o—

Bituminous Coal Research Inc., Pittsburgh, national research agency for the industry, has named a Mining Development Committee and contemplates raising a special fund to consider ways and means for rapid advancement of mining machines and methods to reduce the cost of coal production.

—o—

Cooper-Bessemer Corp., Mt. Vernon, O., has purchased for $237,000 the core shop and foundry it operated at Mt. Vernon during the war for the production of gasoline and diesel engines and air compressors.

—o—

Tantalum Defense Corp., North Chicago, Ill., subsidiary of Fansteel Metallurgical Corp., has purchased the government-owned tantalum plant at North Chicago for $500,000. Property includes 8.26 acres of land, a building with 258,000 sq ft of area and equipment.

—o—

Howard Foundry Co., Chicago, has purchased Steel Foundry Division of Equipment Engineering Co., Los Angeles, and Northrop Gaines Foundry, Los Angeles, which will be integrated with the Chicago firm's Pacific Coast Division, also located in the California city.

—o—

Hercules Powder Co., Wilmington, Del., has opened a sales office in St. Louis for its synthetics and naval stores departments.

—o—

American Iron & Steel Institute, New York, reveals there were 1170 steelmaking furnaces in the United States on Jan. 1 with annual capacity totalling 91,241,250 net tons. Total includes 924 open hearth furnaces, 29 bessemer converters and 217 electric furnaces.

—o—

Lewis-Shepard Products Inc., Watertown, Mass., manufacturer of materials handling equipment, has opened a plant addition, one of whose features is parking space on its roof for 80 automobiles.

—o—

Foxboro Co., Foxboro, Mass., manufacturer of industrial instruments and exclusive United States representative for the Dr. Horn tachometer, announces that all its facilities for the servicing of the Horn instruments have been acquired by James G. Biddle Co., Philadelphia.

—o—

Downs Crane & Hoist Co., Los Angeles, has announced a service which will enable firms to purchase a complete line of cranes ranging from small jib to double girder overhead traveling cranes, as a complete crane or in unit parts, for the assembly and installation in their own plants.

—o—

Continental Foundry & Machine Co., East Chicago, Ind., has purchased government-owned steel facilities in plants at East Chicago and Wheeling, W. Va., for $600,000. The facilities were installed in the plants, which are owned by Continental, at a cost of $3,507,730.

—o—

Westinghouse Electric Corp., Pittsburgh, has published a 16-page booklet outlining its products and research facilities for the aviation industry.

—o—

Allied Research Products Inc., Baltimore, newly formed, has purchased the Iridite Division of Rheem Mfg. Co. In addition to manufacturing and selling iridite, the firm will deal in a line of copper gift ware and will also operate a metal-finishing job shop.

—o—

Jensvold Mfg. Co., Olympia, Wash., metalworking firm, has changed its name to Western Metalcraft Inc.

—o—

Fond du Lac Automatic Washing Machine Division, Fond du Lac, Wis., Barlow & Seelig Mfg. Co., is re-tooling as part of a program to increase production.

The Business Trend

Recovery in Industrial Production Is Checked

AFTER INDUSTRIAL activity regained in one week a little more than half of the momentum lost in recent weeks the recovery movement was checked in the week ended Apr. 26, with the result STEEL's industrial production index registered 160 per cent of the 1936-1939 average. In the week ended Apr. 19 the index had jumped 5 points to 161 per cent.

The latest decline results partially from a drop in automobile output, which in the week ended Apr. 26 was estimated at 100,675 passenger cars, trucks and busses, compared with 105,337 in the preceding week. Principal factor in depressing auto production was a work suspension during a mass labor demonstration.

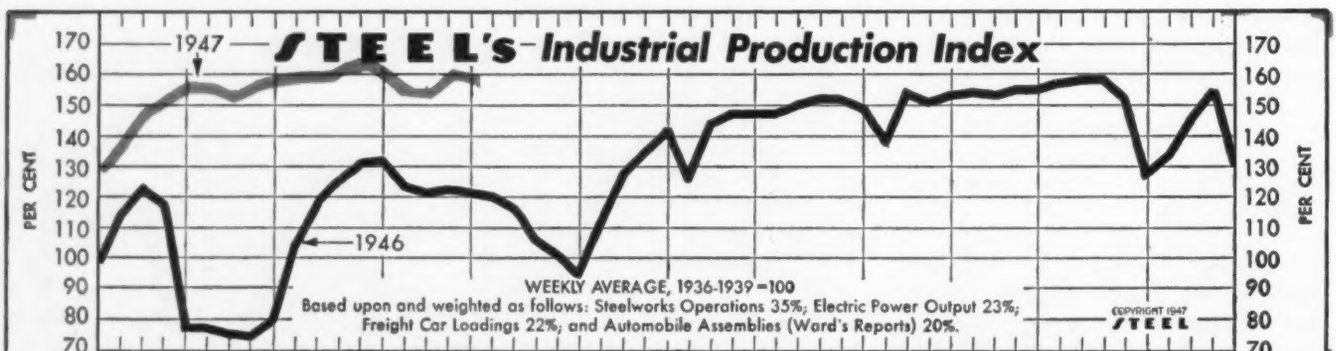
STEEL—Steelmaking operations continue at a high rate, being not far below the record peacetime high of 97 per cent established late in March and early in April. Reaching of wage agreements in the basic steel industry removes strike threats and gives promise of continued high ingot production.

COAL—For the first time in a month, bituminous coal output in the week ended Apr. 19 was back near the level that had prevailed this year before the recent miners' work stoppages. Yield that week was estimated at 12,590,000 net tons, compared with 7,050,000 tons in the preceding week. Despite the recent work stoppages, total output this year through Apr. 19 was 22,095,000 net tons, or 13.5 per cent, ahead of that for the corresponding period of last year, for the 1946 production was held down too by strikes.

CAR LOADINGS—High level industrial activity thus far this year has pushed railroad car loadings 10 per cent above those for the corresponding period of 1946. Loadings in each of the weeks in 1947 have exceeded those for the corresponding week of last year. Loadings recently had been held down by the coal miners' work stoppage but resumption of full scale mining was followed by a jump in total railroad car loadings in the week ended Apr. 19 to 865,846, highest since the week ended last Nov. 16.

CONSTRUCTION—The U. S. Department of Commerce has revised downward its estimate of total building expenditures in 1947. Citing buyer resistance to increased costs, uncertainty over future prices, and apprehension regarding business prospects for the rest of the year, the department now estimates total building expenditures will be between $18.3 billion and $19.6 billion, compared with its original estimate of $21.6 billion.

PRICES—In declining for the third consecutive week, the U. S. Bureau of Labor Statistics index of commodity prices in the week ended Apr. 19 showed the greatest decrease of the year, six-tenths of 1 per cent. In only four other weeks this year had a decline been registered. The index, now standing at 147.2 per cent of the 1926 average, is 1.5 per cent below the 1947 peak level recorded in the week ended Mar. 29.



The Index (see chart above): **Latest Week (preliminary) 160** **Previous Week 161** **Month Ago 160** **Year Ago 121**

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.5	95.5	97.0	70.0
Electric Power Distributed (million kilowatt hours)	4,668	4,660	4,729	3,977
Bituminous Coal Production (daily av.—1000 tons)	2,098	1,175	2,147	129
Petroleum Production (daily av.—1000 bbl.)	4,930	4,912	4,865	4,672
Construction Volume (ENR—Unit $1,000,000)	$88.4	$110.1	$60.1	$131.6
Automobile and Truck Output (Ward's—number units)	100,675	105,337	100,355	64,620

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

TRADE

Freight Carloadings (unit—1000 cars)	860†	866	829	660
Business Failures (Dun & Bradstreet, number)	66	68	63	17
Money in Circulation (in millions of dollars)‡	$28,105	$28,163	$28,170	$27,877
Department Store Sales (change from like wk. a yr. ago)‡	−6%	−6%	+12%	+51%

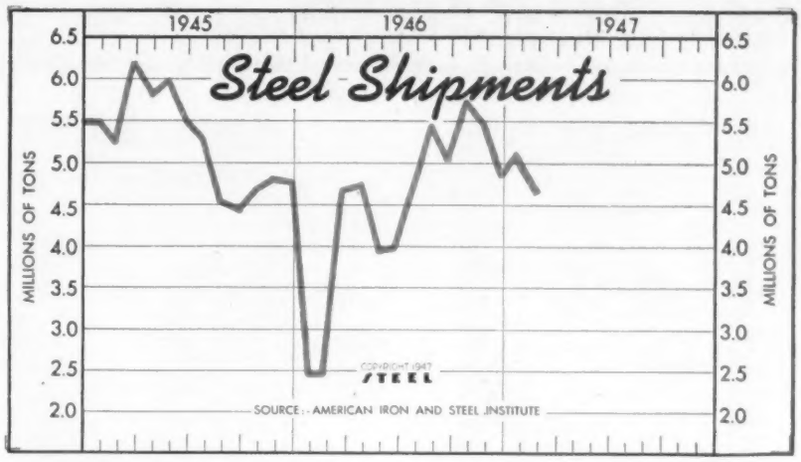
† Preliminary. ‡ Federal Reserve Board.

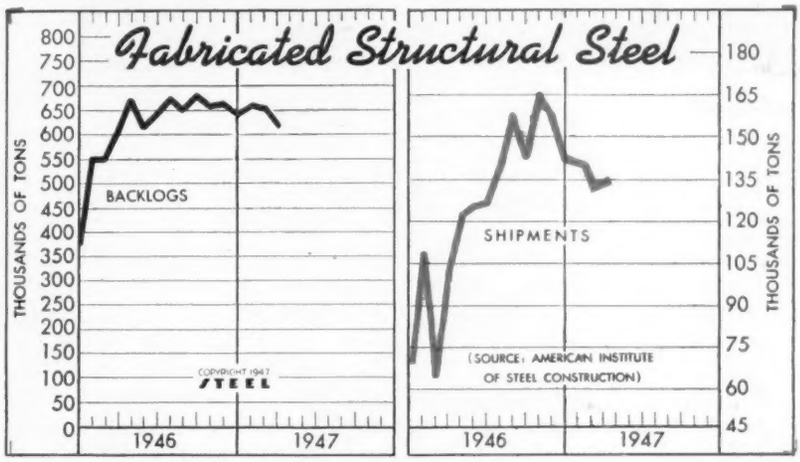
Steel Shipments

(Net Tons)

	1947	1946	1945
Jan.	5,062,990	2,391,850*	5,435,647
Feb.	4,626,424	2,391,849*	5,184,498
Mar.		4,644,988	6,179,452
Apr.		4,698,081	5,769,786
May		3,906,064	5,938,055
June		3,966,628	5,437,206
July		4,639,610	5,214,074
Aug.		5,406,470	4,512,637
Sept.		4,994,377	4,391,143
Oct.		5,675,339	4,660,237
Nov.		5,404,498	4,779,628
Dec.		4,854,207	4,729,561

* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,783,699 tons.





Fabricated Structural Steel

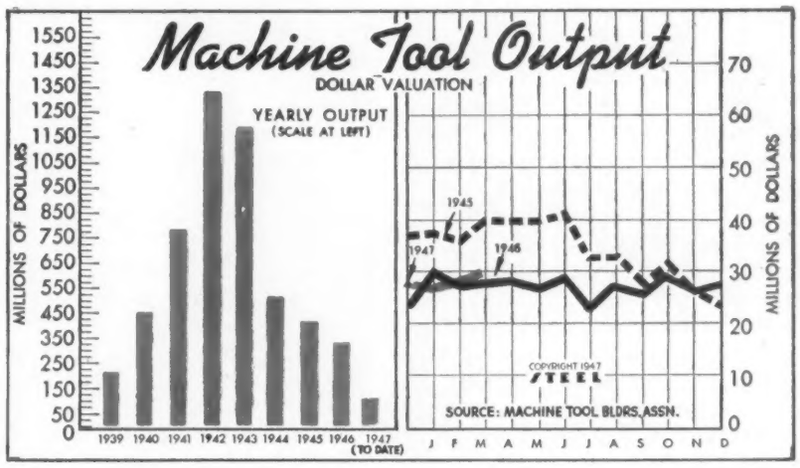
(000 Tons)

	Shipments			Backlogs		
	1947	1946	1945	1947	1946	1945
Jan.	138.7	107.5	57.0	661	552	124
Feb.	132.8	63.8	49.0	656	551	152
Mar.	134.0	102.8	59.5	614	605	153
Apr.	....	122.5	62.8	...	674	163
May	....	124.4	72.6	...	615	166
June	....	126.8	69.2	...	642	195
July	....	140.2	69.9	...	674	194
Aug.	....	157.5	70.6	...	651	201
Sept.	....	141.9	63.4	...	682	248
Oct.	....	164.7	76.6	...	660	283
Nov.	....	157.3	78.0	...	665	305
Dec.	....	142.1	68.8	...	646	375
Total	....	1,551.6	797.4	...	...	...

Machine Tool Shipments

(000 omitted)

	1947	1946	1945	1944
Jan.	$26,542	$30,263	$37,353	$56,363
Feb.	26,765	26,949	36,018	50,138
Mar.	29,012	27,326	40,045	51,907
Apr.	.....	28,108	40,170	41,370
May	.....	26,580	39,825	41,819
June	.....	28,580	41,040	41,471
July	.....	22,360	32,504	32,753
Aug.	.....	26,911	32,500	35,177
Sept.	.....	25,468	27,300	35,889
Oct.	.....	29,140	31,200	37,516
Nov.	.....	26,176	26,084	36,277
Dec.	.....	27,587	23,276	36,784
Total	.....	$325,448	$407,315	$497,464



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,438	$12,066	$12,913	$11,371
Federal Gross Debt (billions)	$257.9	$258.0	$259.2	$274.3
Bond Volume, NYSE (millions)	$18.0	$23.9	$17.6	$29.8
Stocks Sales, NYSE (thousands)	4,380	6,966	4,448	7,282
Loans and Investments (billions)†	$55.3	$54.9	$55.5	$65.5
United States Gov't. Obligations Held (millions)†	$34,814	$34,296	$35,258	$47,050

† Member banks, Federal Reserve System.

PRICES

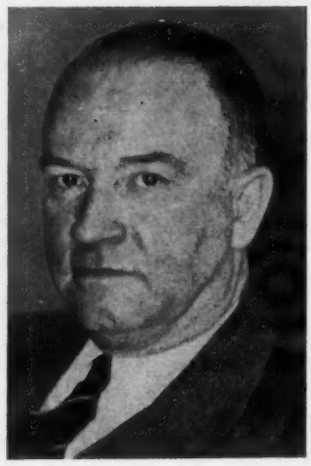
STEEL's composite finished steel price average	$69.82	$69.82	$69.82	$63.54
All Commodities†	147.2	148.1	149.0	109.6
Industrial Raw Materials†	160.3	163.4	164.3	123.0
Manufactured Products†	142.1	142.0	143.1	105.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

WALTER L. EDEL

GEORGE M. LUND



NEWELL H. ORR

Walter L. Edel has been appointed vice president, Clayton & Lambert Mfg. Co., Louisville. He will be in charge of engineering and research. Formerly dean of the School of Engineering, University of Connecticut, Mr. Edel joined Clayton & Lambert in 1943.

—o—

John H. Hall, general auditor, Youngstown Sheet & Tube Co., Youngstown, has been named treasurer of the company to succeed **George E. Benson,** who has retired. **Paul M. Haas** has been appointed general auditor. Attorney **Floyd D. Hunter has** been named assistant secretary, and **Lewis B. Williams,** chairman of the National City Bank of Cleveland, has been named to the executive committee to succeed **Frank A. Scott.**

—o—

David C. Peterson has been appointed director of engineering and research at the main Chicago plant of Stewart-Warner Corp., Chicago. For the past six years he has been engaged as an industrial consultant to several large diesel engine manufacturers. Previously he had been associated with the Continental Can Co., Chicago.

—o—

Robert E. Cryor, general manager of the Cicero, Ill., plant of the Union Asbestos & Rubber Co., Chicago, has been elected a vice president and a director. **A. A. Halle Jr., Hugo Anderson,** and **Hugo Sonnenschein** have also been elected to the board of directors.

—o—

Edward B. Greene, president, Cleveland-Cliffs Iron Co., Cleveland, has been elected chairman of the board. He is succeeded as president by **Alexander C. Brown,** formerly vice president, who has also been elected a director of the company. Mr. Brown has resigned as a vice president and a director of the Cliffs Corp., Cleveland, and **V. P. Geffine,** another vice president of the Cliffs Corp., has been elected to the board of directors of that corporation. These changes have followed the recent resignation of **William G. Mather,** who had been chairman and a director of both companies.

—o—

George M. Lund has been elected president of the Despatch Oven Co., Minneapolis, to succeed the late **H. L. Grapp.** Mr. Lund has been comptroller, vice president and assistant to the president. **C. P. Doherty** has been named executive vice president and general manager. He was formerly factory manager for the company. Other officers and directors appointed include **G. L. Schuster,** vice president-treasurer and chief engineer; **Fred Larson,** vice president-secretary and chief electrical engineer; **Mrs. Ida S. Grapp,** director; **John W. Watson,** vice president.

—o—

John J. Lee, vice president in charge of production of the Twin Coach Co. plant in Buffalo, has been elected a director of the company.

—o—

Meyer Ruchman, Indiana Rolling Mill Baling Corp., Ft. Wayne, Ind., has been elected president of the Indiana chapter of the Institute of Scrap Iron & Steel Inc., Washington. He succeeds **Frank I. Kilcline,** who has resigned.

—o—

D. W. Tyrrell has been elected president, Ray-O-Vac Co., Madison, Wis. He succeeds **W. W. Cargill,** who has been elected chairman of the board of directors.

—o—

Willard Lynch Jr. has been named sales manager, Keystone Cold Drawn Steel Co., Spring City, Pa. He succeeds **Paul Newcomb,** who recently resigned to become president of the Precision Drawn Steel Co. Inc., Camden, N. J.

—o—

Newell H. Orr, Colorado Fuel & Iron Corp., Denver, has been appointed vice president in charge of sales for the corporation and its subsidiary companies. He has been in charge of Western Division sales for the corporation. **William S. Boyce** has been appointed general manager of railroad sales, and **F. S. Jones,** general manager of commercial sales of the Western Division.

—o—

Brison Wood has been elected treasurer of the Minneapolis-Honeywell Regulator Co., Minneapolis. He succeeds **Willard L. Huff,** who has been serving as executive vice president and treasurer. Mr. Huff will continue to serve as a director of the company, and executive vice president.

—o—

G. A. Wilkinson has been appointed export regional service supervisor for Hudson Motor Car Co., Detroit.

—o—

N. C. Michels has been appointed chief engineer, Laclede-Christy Clay Products Co., St. Louis. He formerly had been associated with the Carnegie-Illinois Steel Corp., in the Gary Steel Works, Gary, Ind. **E. H. Krautheim** has been appointed assistant chief engineer in charge of plant engineering and maintenance, and **Les Mueller,** assistant chief engineer of the Arch & Wall Division. **Herman W. Weber,** formerly chief engineer of the Arch & Wall Division, has been added to the executive staff as consulting engineer.

—o—

Charles R. Hook has been re-elected president and has been named chairman of the Executive Committee at the recent meeting of the board of directors of

Cutting Better Threads...Faster

SUNICUT 196...

Speeds Up Threading of Automatic Sprinkler Pipes, Improves Quality of Threads

Here is a case where a big manufacturer of automatic fire-sprinkler systems increased production and improved his threads by replacing a special, expensive oil with Sunicut 196.

Machine: No. 5 Landis Pipe-Threading Machine.
Operation: Threading ⅜" to 8" Pipe. **Lubricant:** Sunicut 196.

In this case, a saving of 15% in oil costs resulted. This is a typical example of how Sun's "Job-Proved" cutting oils have aided in speeding up production and in reducing costs.

Machine-tool operators prefer Sunicut because it is a clear, transparent, free-flowing, sulphurized mineral oil. Sunicut is recommended for those exacting jobs where an emulsifiable cutting oil is not suitable.

Other "Job-Proved" Sunicut grades are suitable for use on automatic lathes, gear-cutters, etc. Contact the nearest Sun office for recommendations.

SUN OIL COMPANY · ***Philadelphia 3, Pa.***
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN
SUNOCO
INDUSTRIAL PRODUCTS

American Rolling Mill Co., Middletown, O. **Calvin Verity** has been elected chairman of the Finance Committee, **W. W. Sebald,** executive vice president; **R. L. Gray,** vice president; **F. E. Vigor,** vice president; **J. A. Ingwersen,** vice president; **C. H. Murray,** vice president; **H. H. Tullis,** vice president and controller; **W. D. Vorhis,** secretary; and **F. D. Danford,** treasurer.

—o—

Glen Hoover has been assigned to direct important accounts in Canadian territory for American Rolling Mill Co., Middletown, O. He will have headquarters in Buffalo. **Don H. Hogan** has been promoted to manager of the Cleveland district.

—o—

W. H. Stewart, Seattle service manager, Hagan Corp. and Hall Laboratories, Pittsburgh, has been appointed sales engineer for combustion control and boiler water conditioning, Pittsburgh office.

—o—

Grant F. Neely and **Harry J. Anderson** have been named sales engineers for Vulcan Mold & Iron Co., Latrobe, Pa.

—o—

Arthur F. Bixby, chemical salesman in the Philadelphia office, Pennsylvania Salt Mfg. Co., Philadelphia, has been transferred to the Pittsburgh office, succeeding **C. W. Dermitt,** who recently was appointed district sales manager, Cincinnati. **Edwin M. Ott,** chemical engineer in the market research department, has been named assistant manager of market research, succeeding **George T. Collins,** who had been appointed manager some months ago.

—o—

William B. Ferguson has joined the staff of Freyn Engineering Co., Chicago, as electrical engineer.

—o—

Charles W. Deeds, formerly president, Niles-Bement-Pond Co., West Hartford, Conn., has been elected a director of Fairchild Engine & Airplane Corp., New York.

—o—

Frank A. Hoel has been appointed New York City zone manager, Chevrolet Division, General Motors Corp., Detroit.

—o—

Samuel R. Rhoads has been appointed manager of the Hydraulic Machinery Division, R. D. Wood Co., Philadelphia.

—o—

Robert P. Nichols has been appointed assistant domestic sales manager, R. G. LeTourneau Inc., Peoria, Ill.

—o—

Thomas A. Dodge, Union Refrigerator Transit Co., subsidiary of General American Transportation Corp., Chicago, has been appointed executive assistant to the vice president. **Donald E. Aylward** has been named superintendent of car service of the company.

—o—

Louis W. Falk, Richard S. Falk and **Leroy J. Burlingame** have been elected to the board of directors of Falk Corp., Milwaukee.

—o—

John C. Cushing has been appointed director of industrial relations, United States Steel Supply Co., Chicago, subsidiary of U. S. Steel Corp. He succeeds **J. W. B. Foringer,** who has resigned.

—o—

The following officers have been elected by the Cincinnati Milling & Grinding Machines Inc., Cincinnati, subsidiary of the Cincinnati Milling Machine Co.: **Frederick V. Geier,** president; **Walter W. Tangeman, Swan E. Bergstrom,** and **Nelson F. Caldwell,** vice presidents; **Ferris M. Angevin,** treasurer; **Millard Romaine,** secretary.

—o—

R. H. Daisley, vice president and director of operations, Eaton Mfg. Co., Cleveland, has been elected a director of the Cleveland Hobbing Machine Co.

—o—

Frank P. Bleier, for the past four years director of research and development, Ilg Electric Ventilating Co., Chicago, has established his own consulting offices at 547 West Addison St., Chicago. He will serve as designer to manufacturers whose lines include fans, blowers, or compressors (axial flow or centrifugal type), either as self-contained units or as auxiliary equipment of various types of machinery.

—o—

The following promotions have been announced by the Bridgeport Brass Co., Bridgeport, Conn.: **Willam R. Breetz,** vice president and treasurer; **Michael Schwarz,** vice president in charge of procurement; **Robert N. Allen,** vice president for Indianapolis; **John S. Dawson,** secretary; **Everett Japp,** assistant vice president and assistant secretary; **Stanley Z. Bronner,** assistant treasurer; and **Ray J. Sever,** assistant treasurer for Indianapolis. **Walter R. Clark,** vice president, and **Warren J. Faust,** assistant treasurer, have retired from the company.

—o—

T. M. Haddock has been named district purchasing agent of the eastern districts, American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp. He will be located in Worcester, Mass. **Otto C. Langenhan** has been appointed acting district purchasing agent in Cleveland, and **Frank J. Vaigl** succeeds him as chief clerk and buyer in Cleveland.

—o—

C. P. McNamara has been appointed sales manager of the Milwaukee Division, Morton Salt Co., Chicago.

—o—

The Bailey Meter Co., Cleveland, has announced the appointment of three engineers to branch offices: **R. L. Stewart** has been assigned to Denver, **L. E. Bartel** to Kansas City, Mo., and **G. D. Williams** to Atlanta.

—o—

Rudolph E. Reimer has been elected a vice president, Dresser Industries Inc., Cleveland. He has been secretary and treasurer of the company.

—o—

William F. Longfield has been appointed chief sales engineer, Warren City Mfg. Co., Warren, O. He has been associated for the past 35 years with the Cleveland Punch & Shear Works Co., Cleveland.

—o—

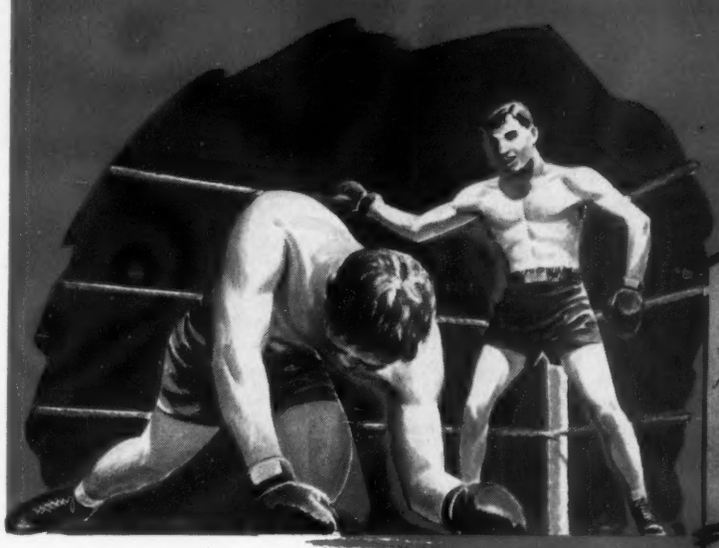
The election of the following officers and directors has been announced by the Purchasing Agents Association of Syracuse and Central New York; **J. E. Edmonds,** Lipe-Rollway Corp., Syracuse, N. Y., first vice president; **D. H. Covert,**

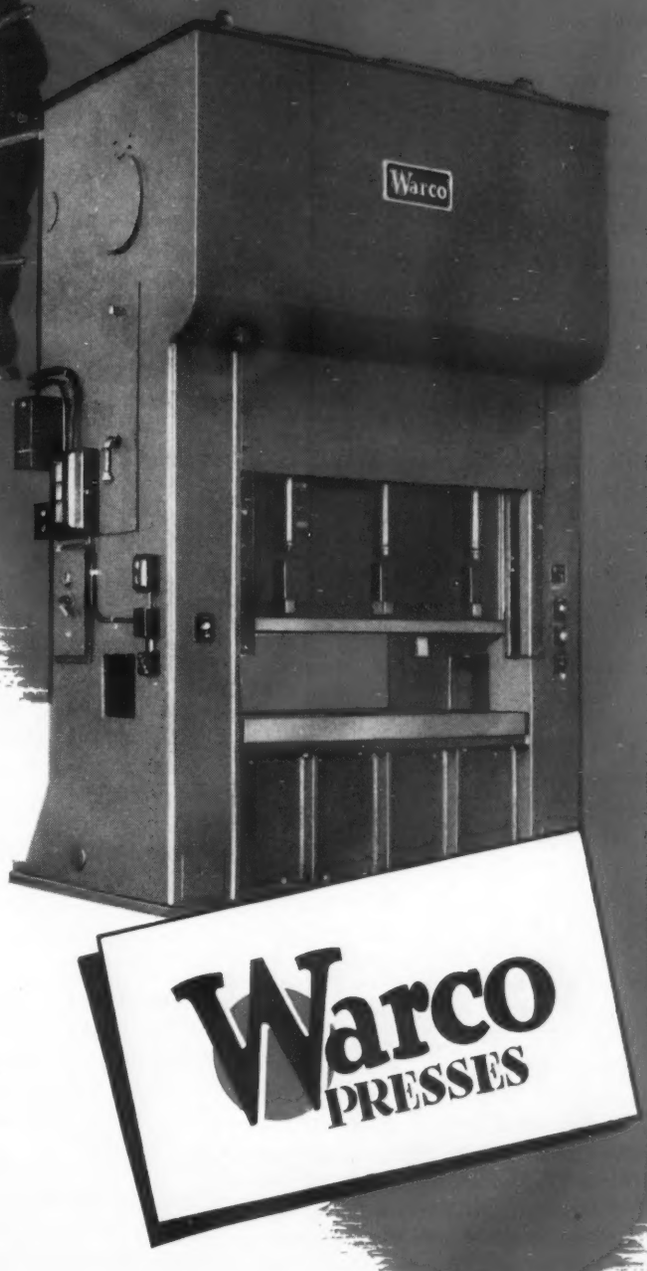
FRANK P. BLEIER

WILLIAM F. LONGFIELD

KNOCK DOWN MAINTENANCE COSTS

. . . Increase Stamping Profits





WARCO PUNCH PRESSES AND PRESS BRAKES are engineered and built to exacting standards of design and craftsmanship.

Warco fully stress-relieved, welded steel frame construction provides maximum resistance to deflection even under the most severe overload.

Warco *split-precision craftsmanship* reduces backlash, lost motion, vibration, wear.

This adds up to a press that reduces down time, increases life of costly dies, produces more parts per die grind.

Make your press problems our problems. Arrange, today, to consult our skilled engineering staff, or better still, visit our modern plant, the largest of its kind in the world.

WARREN CITY MANUFACTURING COMPANY
457 Griswold Street, Warren, Ohio
A subsidiary of The Federal Machine and Welder Company
Offices in Principal Cities

Warco PRESSES

International Business Machines Corp., Endicott, N. Y., second vice president; **M. Riepel**, Alexander Grant's Sons Co., Syracuse, N. Y., treasurer; **G. L. McCaffrey**, Auto-Lite Battery Corp., Syracuse, N. Y., secretary. The directors elected are **C. L. Patchin**, national director, and **J. M. Austin, F. L. Howard, F. G. Hefti,** and **Hazen Hinman.**

—o—

O. C. Price Jr. has been appointed sales promotion manager, Motor Truck Division, International Harvester Co., Chicago. **R. C. Burns** has been named assistant manager of the New York City sales district.

—o—

William R. Geary Jr. has been appointed assistant to the controller, Rheem Mfg. Co., San Francisco. **Andrew W. Hughes** has been named supervisor of the Central Cost Bureau, with headquarters in the New York office.

—o—

Marshall T. Gorton has resigned as sales promotion manager, Kaiser-Frazer Corp., Willow Run, Mich. He has joined Swaney, Drake & Bement Inc. as manager of the Detroit office.

—o—

Karl S. Kramer has been appointed assistant manager of the general purpose turbine section, and **John C. Spahr,** assistant manager of the industrial turbine section, Westinghouse Steam Division, Westinghouse Electric Corp., Pittsburgh.

—o—

Ivan L. Nixon and **Ben A. Ramaker** have been elected vice presidents of Bausch & Lomb Optical Co., Rochester, N. Y. **William W. McQuilkin,** company secretary, has been elected assistant treasurer, and **Joseph W. Taylor,** assistant secretary.

—o—

The Eaton Mfg. Co., Cleveland, has announced establishment of three new Michigan divisions of the company, replacing the former Wilcox-Rich Division. The three general managers appointed to head these divisions are **H. I. Dyer,** in charge of the Valve Division, which has plants in Battle Creek and Lawton, Mich.; **Herbert Russell,** in charge of the Saginaw Division with plants in Saginaw, Mich.; and **F. H. Mott Jr.,** in charge of the Pump Division. Mr. Mott will maintain offices in Detroit, where sales, engineering, and research departments for all three divisions will be located.

—o—

Frank T. Ward, vice president and chief engineer of the Third Avenue Transit Corp., New York, has been elected chairman of the Mechanical Standards Committee of the American Standards Association, New York. **Frank O. Hoagland,** vice president of Pratt & Whitney Division, Niles-Bement-Pond Co., Hartford, Conn., has been elected vice chairman of the committee. Mr. Ward represents the American Transit Association, and Mr. Hoagland, the National Machine Tool Builders' Association.

—o—

Neil Petree, Frederick E. Hines, and **Edward H. McLaughlin** were elected directors of Douglas Aircraft Corp., Santa Monica, Calif.

—o—

Glenn B. Warren, design engineer, Turbine-Generator Engineering Division, General Electric Co., Schenectady, N. Y., has been named managing engineer of the division to succeed **Arthur R. Smith,** retired.

—o—

G. V. Patrick has been elected president, and **J. H. Snyder,** vice president, of the Etched Metal Co., Cleveland.

—o—

John Paul Jones, recently chief production engineer, Universal Cooler Division, International Detrola Corp., at Marion, O., has been appointed chief engineer at Bendix Home Appliances Inc., South Bend, Ind.

—o—

Carl F. Roby has been elected a vice president of the Cincinnati Milling Machine Co., Cincinnati. He has been managing director of the subsidiary company, Cincinnati Milling Machines Ltd., Birmingham, England.

—o—

Cecil Myers, Edgar Allen & Co. Ltd., Sheffield, England, has retired as senior representative in the Lancashire and northwestern England areas. He will act as a consultant until the end of the year.

—o—

Robert P. Tyler has been elected vice president in charge of sales, Macwhyte Co., Kenosha, Wis. He was formerly general sales manager.

—o—

John M. Otter, formerly sales manager of the Radio Division, Philco Corp., Philadelphia, has been promoted to general sales manager of the corporation. He is succeeded in the Radio Division by **Fred Ogilby.**

—o—

Harry R. Eckblade has been appointed assistant general service manager, Oldsmobile Division of General Motors Corp., Detroit. He succeeds **S. C. Starnaman,** who has been promoted to chief inspector for Oldsmobile.

—o—

The A. P. Green Fire Brick Co., Mexico, Mo., has announced the reorganization of management control into six major divisions of which **Herbert B. Plunkett** has been named director of sales, both domestic and export operations; **Arthur D. Bond,** director of affiliate and subsidiary companies, both domestic and foreign; **Lester J. Miller,** director of manufacturing; **Neal S. Wood,** director of procurement and properties; **D. H. Kreutzer,** director of finance; and **Walter G. Staley,** director of industrial relations. All six of these men are vice presidents and members of the board of directors of the company.

—o—

P. G. Forman, operating vice president, Industrial Silica Corp., Youngstown, has been elected a director of the company. He succeeds **Chess Lamberton,** who has resigned.

—o—

William F. Knutson has been named chief engineer and vice president, Product Development Division, Engineering Inc., Milwaukee.

—o—

Frank R. Somers, formerly manager of replacement sales, Willard Storage Battery Co., Cleveland, has been promoted to director of merchandising, with jurisdiction over all replacement sales activities, including the sales force in the field.

—o—

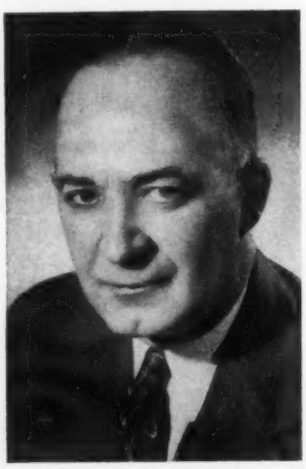
E. A. Erickson has been appointed shop superintendent, and **Myron G. Caylor,** office manager of the new Hornell plant, SKF Industries Inc., Philadelphia. Operation in this plant starts July 1.

—o—

John W. Kemper, Jack & Heintz Precision Industries Inc., Bedford, O., has been elected controller, succeeding **Gilbert H. Hoffman,** resigned.

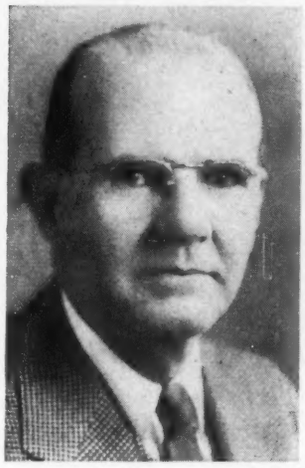
—o—

Bernard H. Lord, Chicago district sales engineer, Ceco Steel Products Corp., Chicago, has been appointed district manager of the company's New Orleans office. **Walter E. Lord** has been named district manager of the Milwaukee office. He

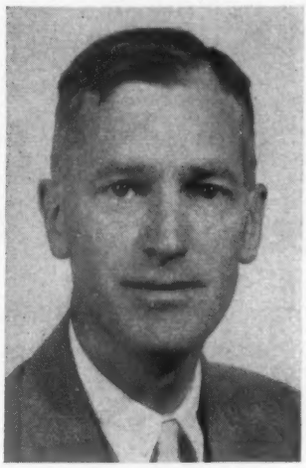


WALTER A. JAYME

Appointed assistant general superintendent, Gary, Ind., works, National Tube Co., subsidiary, U. S. Steel Corp., Chicago. Noted in STEEL, Apr. 28 issue, p.95



S. HORACE DISSTON
Elected chairman of the board, Henry Disston & Sons Inc., Philadelphia. Noted in STEEL, Apr. 28 issue, p. 90



JACOB S. DISSTON JR.,
Elected president, Henry Disston & Sons Inc., Philadelphia. Noted in STEEL, Apr. 28 issue, p. 90

RICHARD F. V. STANTON
Elected vice president, Niles-Bement-Pond Co., West Hartford, Conn. Noted in STEEL, Apr. 28 issue, p. 90

was formerly associated for 27 years with the Concrete Steel Co., Minneapolis. He succeeds **W. O. Richards,** who has been promoted to assistant manager of the Chicago district office. **Lester R. Wise** has been named manager of the Chicago district office.

—o—

Sidney J. Allen, president of Allen Industries Inc., Detroit, has been elected to the board of directors of Detroit Steel Corp., Detroit.

—o—

J. Herbert Myers, secretary and a director, Lodge & Shipley Co., Cincinnati, has been elected a vice president in charge of machine tool sales. **Harry J. Beuttinger,** treasurer, has been appointed secretary of the company, in addition to his post as treasurer.

—o—

N. Hawthorne Hawkins Jr., manager of the transportation department, Birmingham Electric Co., Birmingham, has been elected a vice president of the company.

—o—

William J. Mericka, Charles J. Smith, and **Lewis J. Thomas** have been elected to the board of directors of Empire Steel Corp., Mansfield, O., filling vacancies which occurred due to the resignation of **Henry A. Roemer** and **B. E. Kibbee,** Sharon Steel Corp., Sharon, Pa.

—o—

Walker Reynolds, vice president, Alabama Pipe Co., Anniston, Ala., has been elected a member of the board of directors, Alabama Power Co.

—o—

Cecil E. Edwards has been appointed field representative in the public relations department, United States Steel Corp. subsidiaries, Southwest Division, with headquarters in Dallas, Tex. His district will comprise Texas, Oklahoma, and New Mexico.

OBITUARIES . . .

John M. Studebaker Jr., 75, son of one of the brothers who founded the business which later became the Studebaker Corp., died Apr. 27. He had been secretary of the Studebaker Corp., South Bend, Ind., for many years, and in 1941, with his son, the late **J. M. Studebaker 3d,** founded the Studebaker Machine Co., Maywood, Ill.

—o—

Leo G. Gorman, 52, purchasing agent of chemicals, metals and oils, Republic Steel Corp., Cleveland, died Apr. 22. He had been with Republic Steel since its incorporation in 1930, and previously had been with the Trumbull Steel Co., Warren, O., which became a unit of the corporation.

—o—

Dr. Charles Strong Comstock, 36, technical director, Monsanto Chemical Co., at the Texas City, Tex., plant, was killed in the recent disaster in that city.

—o—

Tracy D. Waring, 74, retired electrical engineer, Standard Underground Cable Co., Pittsburgh and Hamilton, Ont., died Apr. 27 at his home in East Orange, N. J.

—o—

Walter C. Trout, 73, president, Lufkin Foundry & Machine Co., Lufkin, Tex., died Apr. 24. He was a former vice president and director of the National Association of Manufacturers.

—o—

Lewis E. Skinner, 73, retired representative of Joseph T. Ryerson & Son Inc., Chicago, died Apr. 23.

—o—

Ellery Shoemaker, 82, retired vice president, American Seal-Kap Corp., Long Island City, Queens, N. Y., died Apr. 25 at his home in Plainfield, N. J.

—o—

Michael Strzeminski, 54, night superintendent and a director of the Wesley Steel Treating Co., Milwaukee, died recently.

—o—

William F. Obear, 52, partner and coowner of W. F. Obear & Son, Los Angeles, died recently.

—o—

Thomas J. Fitzsimmons, 79, president, Kitts Steam Specialty Co., Oswego, N. Y., died recently.

—o—

Raymond E. Foster, 54, employment manager, American Laundry Machinery Co., Rochester, N. Y., died Apr. 22.

—o—

John J. Moore, inventor of various types of farm machinery, died Apr. 21.

—o—

Charles A. Buck, president of the Fairfield Barrel Co., Fairfield, Ala., died Apr. 26.

—o—

LeRoy J. Zorn, 64, president, J. H. Channon Corp., Chicago, died Apr. 27.

—o—

Hugo Pagenstecher, 64, Chicago manager, Taylor Instrument Cos., Rochester, N. Y., died Apr. 27, in Park Ridge, Ill.

—o—

Angus E. Huther, 87, founder and former secretary-treasurer, Huther Bros. Saw Mfg. Co., Rochester, N. Y., died Apr. 24.

—o—

Rowland F. Gardner Jr., 74, Grinnell Co. Inc., New York, died Apr. 22.

Steel Truck Body Members

Standardized for Mass Production

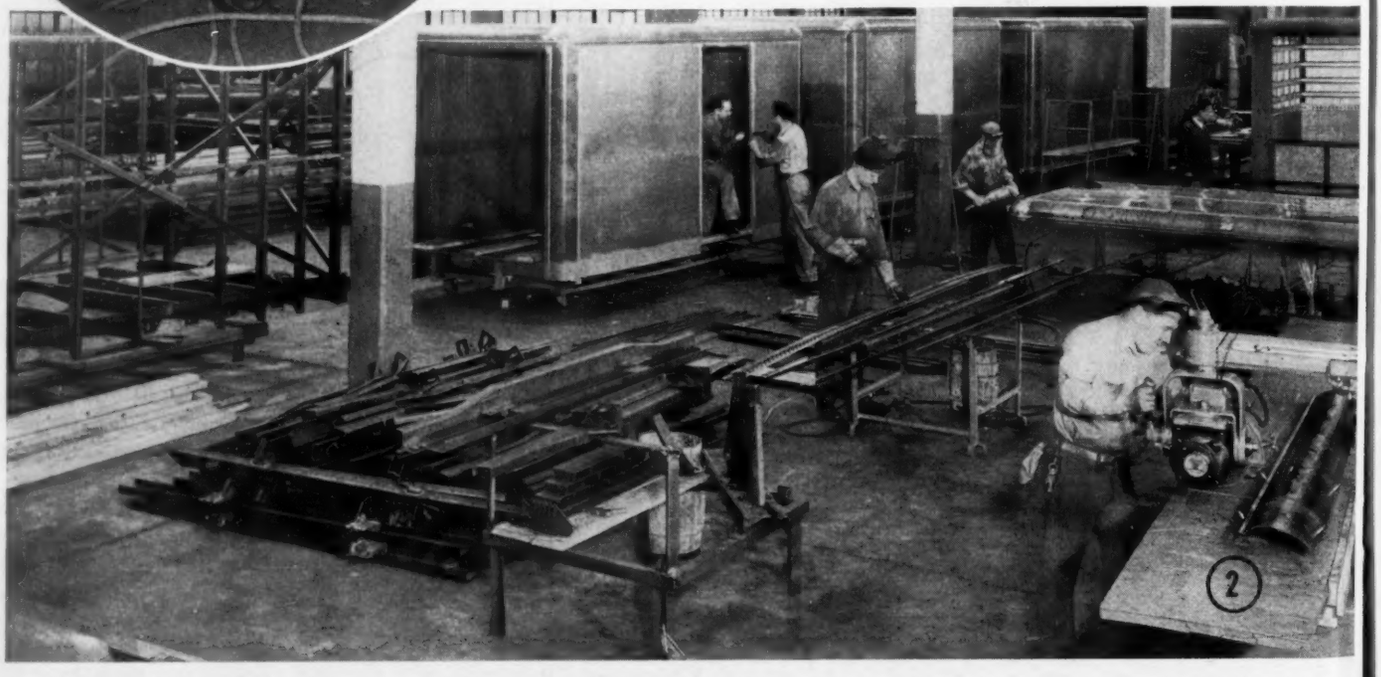
By NELSON E. COLE
Body Research Engineer
Parish Pressed Steel Co.
Reading, Pa.

One of the growing opportunities for steel stampings in the transportation field is a construction method that employs standardized stamped truck body members and simple fabricating techniques. Flexibility of design enables body builders to meet individual truck owners' requirements, using mass-production facilities for custom-built bodies

PLACING custom-building techniques on a mass production basis, builders are turning out steel truck bodies to customer specification at higher speeds and lower costs. While trailer bodies are nearly always standard as to size and type, and constructed for maximum allowable road dimension and load limits, only a few truck fleets in the country are of sufficient size to permit mass production of the body specified.

It is estimated that 70 to 75 per cent of all truck bodies are custom built to meet requirements of the individual user. Truck body dimensions and requirements vary widely according to use. Some are narrow, others wide; some are for heavy loads, others for bulky but light loads; some are long, others short; some are open top, more have roofs; some have doors in the rear end, others in one or both sides. The great majority of truck bodies are made by relatively small, local body builders.

Problem of making it possible for local body builders to meet individual truck owners' requirements through the use of standardized mass-produced truck body shapes and sections that can be easily and quickly assembled has



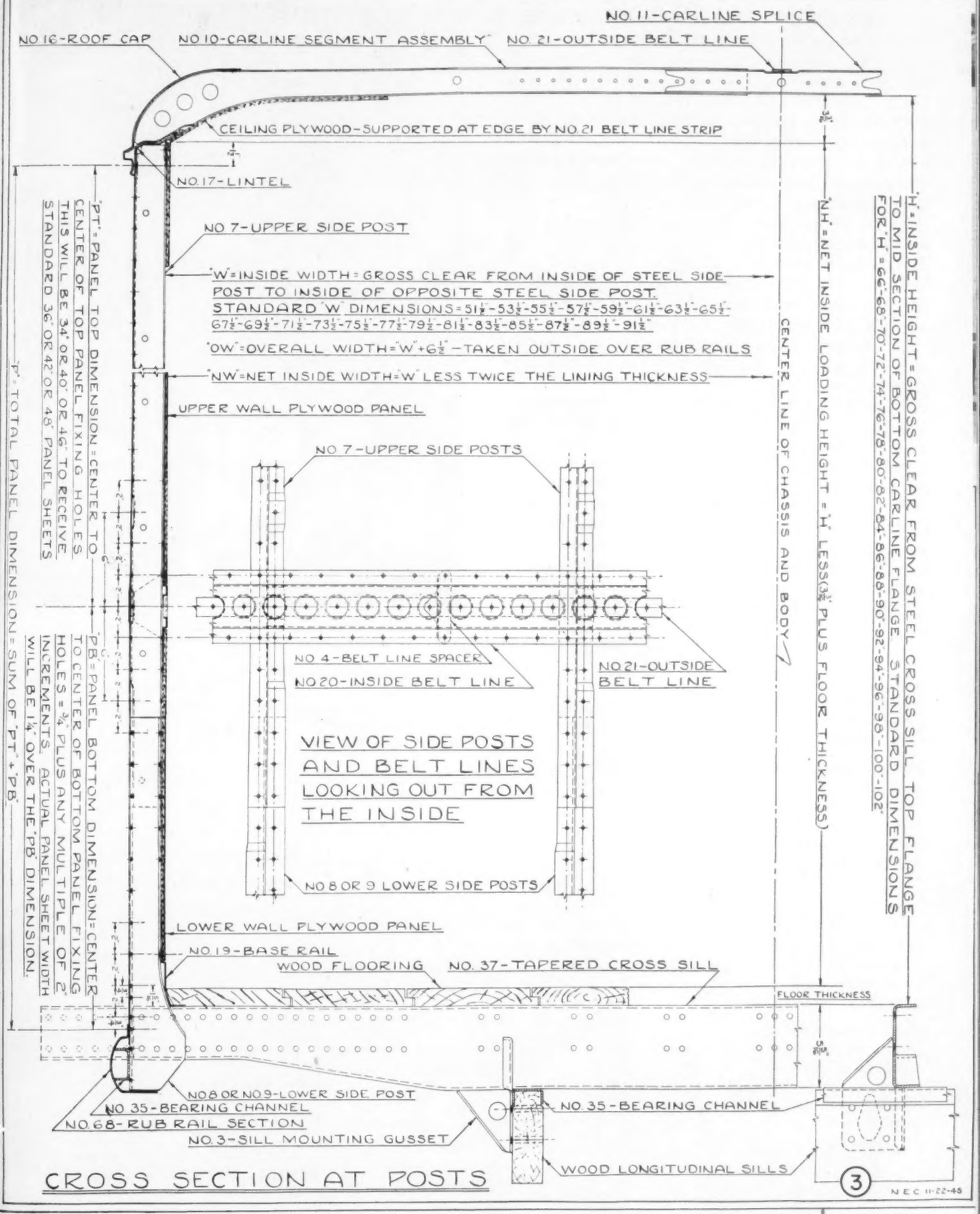

NO. 11-CARLINE SPLICE
NO. 16-ROOF CAP
NO. 10-CARLINE SEGMENT ASSEMBLY
NO. 21-OUTSIDE BELT LINE
CEILING PLYWOOD-SUPPORTED AT EDGE BY NO. 21 BELT LINE STRIP
NO. 17-LINTEL
NO. 7-UPPER SIDE POST
"W"=INSIDE WIDTH=GROSS CLEAR FROM INSIDE OF STEEL SIDE POST TO INSIDE OF OPPOSITE STEEL SIDE POST.
STANDARD "W" DIMENSIONS=51½"-53½"-55½"-57½"-59½"-61½"-63½"-65½"-67½"-69½"-71½"-73½"-75½"-77½"-79½"-81½"-83½"-85½"-87½"-89½"-91½"
"OW"=OVERALL WIDTH="W"+6½"—TAKEN OUTSIDE OVER RUB RAILS
"NW"=NET INSIDE WIDTH="W" LESS TWICE THE LINING THICKNESS
UPPER WALL PLYWOOD PANEL
"PT"=PANEL TOP DIMENSION=CENTER TO CENTER OF TOP PANEL FIXING HOLES
THIS WILL BE 34" OR 40" OR 46" TO RECEIVE STANDARD 36" OR 42" OR 48" PANEL SHEETS
"P"=TOTAL PANEL DIMENSION=SUM OF "PT"+"PB"
"PB"=PANEL BOTTOM DIMENSION=CENTER TO CENTER OF BOTTOM PANEL FIXING HOLES=¾" PLUS ANY MULTIPLE OF 2" INCREMENTS. ACTUAL PANEL SHEET WIDTH WILL BE 1¼" OVER THE "PB" DIMENSION.
NO. 7-UPPER SIDE POSTS
NO. 4-BELT LINE SPACER
NO. 20-INSIDE BELT LINE
NO. 21-OUTSIDE BELT LINE
VIEW OF SIDE POSTS AND BELT LINES LOOKING OUT FROM THE INSIDE
NO. 8 OR 9 LOWER SIDE POSTS
LOWER WALL PLYWOOD PANEL
NO. 19-BASE RAIL
WOOD FLOORING
NO. 37-TAPERED CROSS SILL
FLOOR THICKNESS
NO. 8 OR NO. 9-LOWER SIDE POST
NO. 35-BEARING CHANNEL
NO. 68-RUB RAIL SECTION
NO. 3-SILL MOUNTING GUSSET
NO. 35-BEARING CHANNEL
WOOD LONGITUDINAL SILLS
CENTER LINE OF CHASSIS AND BODY
"H"=INSIDE HEIGHT=GROSS CLEAR FROM STEEL CROSS SILL TOP FLANGE TO MID SECTION OF BOTTOM CARLINE FLANGE. STANDARD DIMENSIONS FOR "H"=66"-68"-70"-72"-74"-76"-78"-80"-82"-84"-86"-88"-90"-92"-94"-96"-98"-100"-102"
"NH"=NET INSIDE LOADING HEIGHT="H" LESS(3¾" PLUS FLOOR THICKNESS)
CROSS SECTION AT POSTS
3
NEC 11-22-45

Fig. 1—Final riveting operations being performed prior to hoisting roof in place after body has been paneled. All photos courtesy White Motor Co.

Fig. 2—View of plant interior showing truck bodies in various stages of construction

Fig. 3—General cross section of typical body frame showing main essential details

been solved by Parish Pressed Steel Co., Reading, Pa. Today over 60 per cent of the commercial truck bodies in Philadelphia consist of assemblies of these mass-produced truck body members.

White Motor Co., Cleveland, obtained the distribution of Parish type B prefabricated body sections and established an experimental body shop in their plant at Philadelphia in order to determine the most efficient production methods that could be developed in the economical fabrication of truck bodies.

By this method body cost is materially reduced, time required for construction greatly shortened, better body design achieved and the truck more readily repaired when damaged. These advantages are the result of designing and producing a series of standard size stampings for cross sills, wall posts, roof members and doors with frames.

Use of high tensile copper bearing steel makes possible truck bodies that are lighter, stronger and more durable than wood framed jobs. It also permits holding designs to more exact limits due to the very close and uniform tolerances of the physical properties of this steel. Thus the safety factor margin of a design in steel can be held much lower than is necessary when wood is used as the basic material of the design. Tests show that whereas in the same make and grade of steel the physical properties seldom vary more than 5 per cent, lumber cut from the same log may vary as much as 200 per cent, an important factor to consider in the design of beams or struts serving to support a load.

Longitudinal bearing sills of (*Please turn to Page* 124)

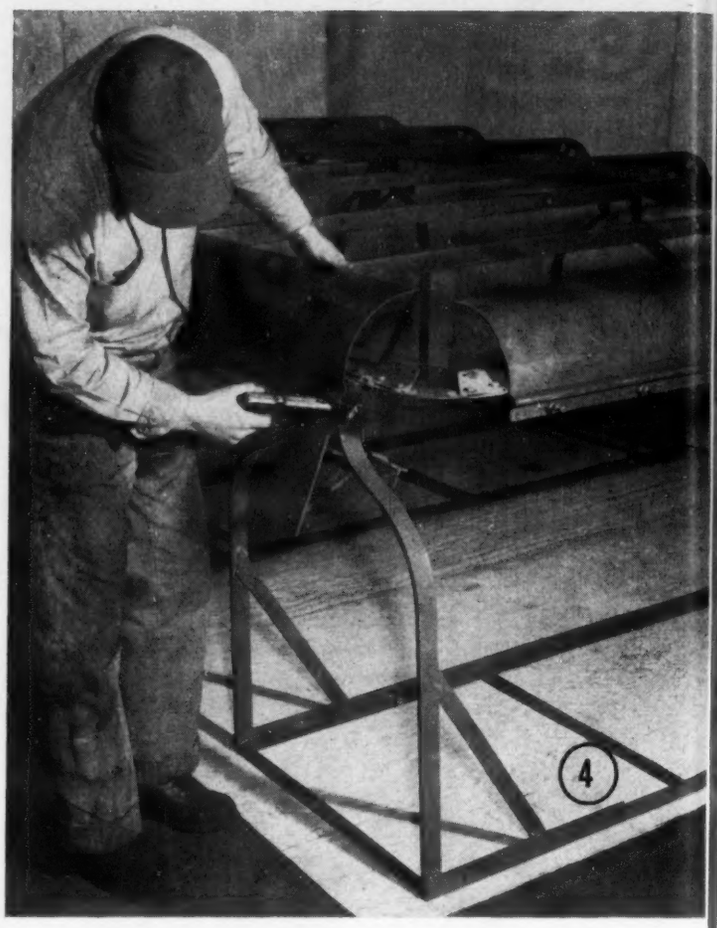


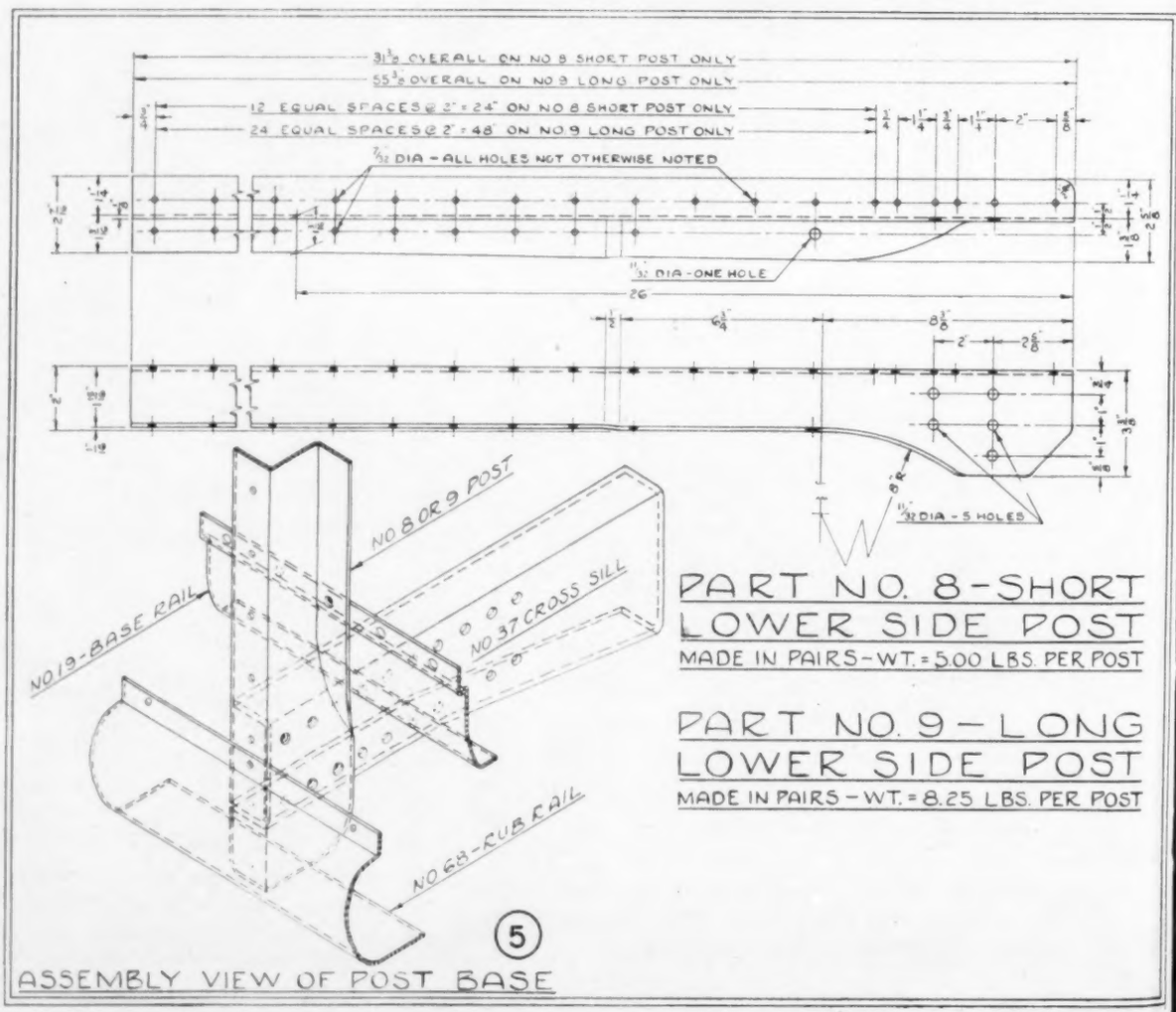
Fig. 4—Roof subassembly in process of assembly on roof framing jig

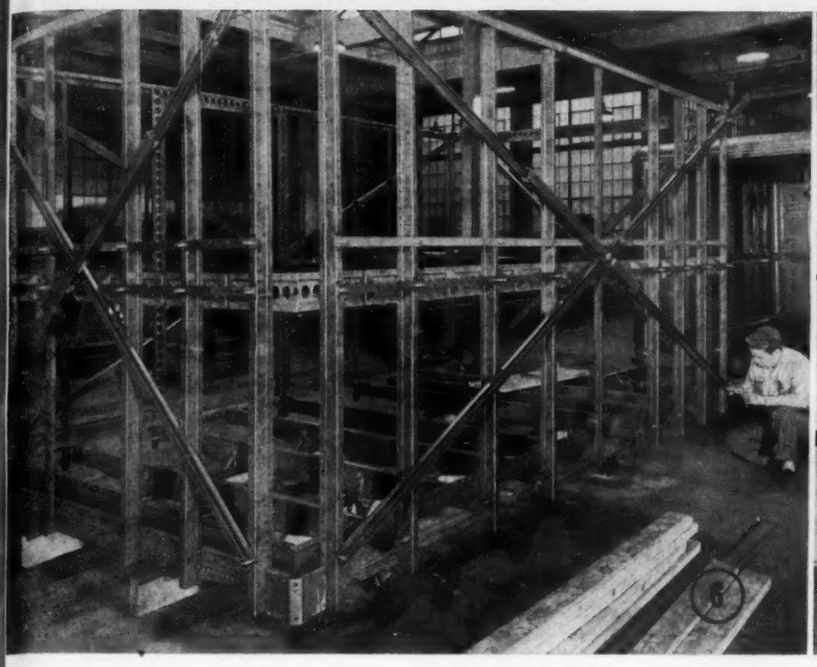
Fig. 5—Arrangement of parts involved where lower side post section connects to the end of the cross sill

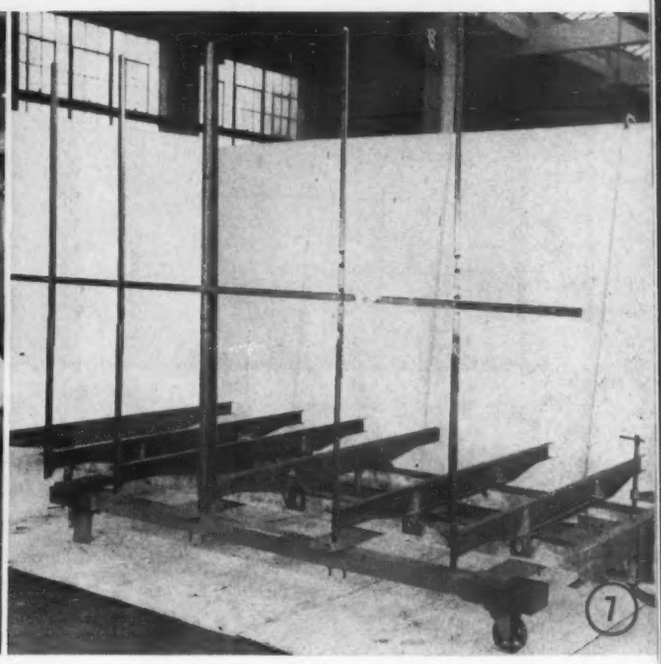
Fig. 6 — Completely pin-assembled body frame being squared with squaring bars

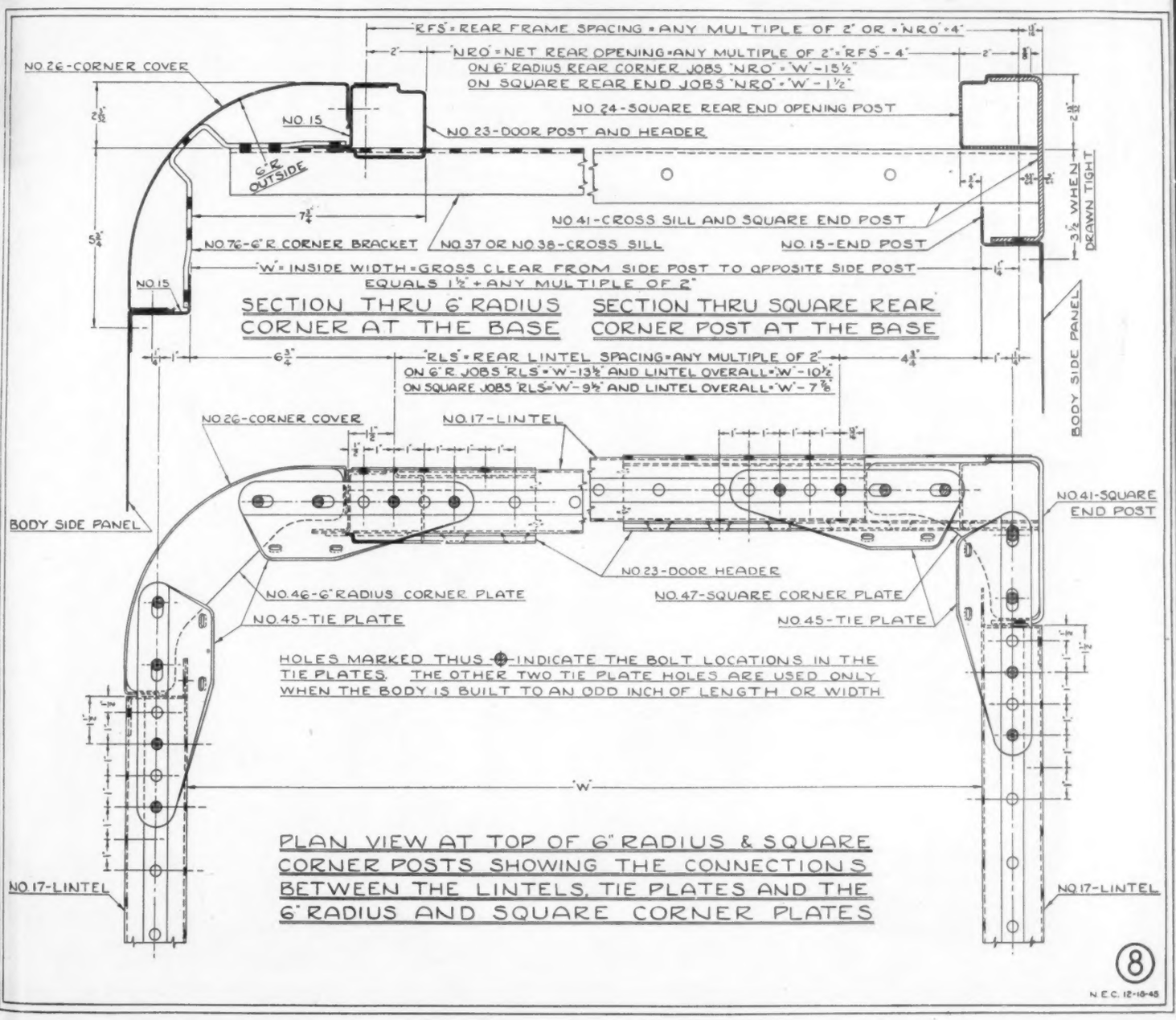
Fig. 7—Advanced state of main framing phase with rear cross bar securely clamped to starting point of assembly

Fig. 8 — Typical connection details at 6-in. radius front and rear corners and at square rear end corner assemblies


31 3/8 OVERALL ON NO 8 SHORT POST ONLY
55 3/8 OVERALL ON NO 9 LONG POST ONLY
12 EQUAL SPACES @ 2" = 24" ON NO 8 SHORT POST ONLY
24 EQUAL SPACES @ 2" = 48" ON NO 9 LONG POST ONLY
7/32 DIA - ALL HOLES NOT OTHERWISE NOTED
11/32 DIA - ONE HOLE
11/32 DIA - 5 HOLES
NO 8 OR 9 POST
NO 19 - BASE RAIL
NO 37 CROSS SILL
NO 68 - RUB RAIL
5
ASSEMBLY VIEW OF POST BASE
PART NO. 8 - SHORT LOWER SIDE POST
MADE IN PAIRS - WT. = 5.00 LBS. PER POST
PART NO. 9 - LONG LOWER SIDE POST
MADE IN PAIRS - WT. = 8.25 LBS. PER POST






"RFS" = REAR FRAME SPACING = ANY MULTIPLE OF 2" OR = "NRO" + 4"
"NRO" = NET REAR OPENING = ANY MULTIPLE OF 2" = "RFS" - 4"
ON 6" RADIUS REAR CORNER JOBS "NRO" = "W" - 15½"
ON SQUARE REAR END JOBS "NRO" = "W" - 1½"
NO 26 - CORNER COVER
NO 15
NO 24 - SQUARE REAR END OPENING POST
NO 23 - DOOR POST AND HEADER
6" R OUTSIDE
3½" WHEN DRAWN TIGHT
NO 41 - CROSS SILL AND SQUARE END POST
NO 76 - 6" R CORNER BRACKET
NO 37 OR NO 38 - CROSS SILL
NO 15 - END POST
"W" = INSIDE WIDTH = GROSS CLEAR FROM SIDE POST TO OPPOSITE SIDE POST
EQUALS 1½" + ANY MULTIPLE OF 2"
NO 15
SECTION THRU 6" RADIUS CORNER AT THE BASE
SECTION THRU SQUARE REAR CORNER POST AT THE BASE
"RLS" = REAR LINTEL SPACING = ANY MULTIPLE OF 2"
ON 6" R JOBS "RLS" = "W" - 13½" AND LINTEL OVERALL = "W" - 10½"
ON SQUARE JOBS "RLS" = "W" - 9½" AND LINTEL OVERALL = "W" - 7⅞"
BODY SIDE PANEL
NO 26 - CORNER COVER
NO 17 - LINTEL
NO 41 - SQUARE END POST
BODY SIDE PANEL
NO 23 - DOOR HEADER
NO 46 - 6" RADIUS CORNER PLATE
NO 47 - SQUARE CORNER PLATE
NO 45 - TIE PLATE
NO 45 - TIE PLATE
HOLES MARKED THUS ⊕ INDICATE THE BOLT LOCATIONS IN THE TIE PLATES. THE OTHER TWO TIE PLATE HOLES ARE USED ONLY WHEN THE BODY IS BUILT TO AN ODD INCH OF LENGTH OR WIDTH
"W"
NO 17 - LINTEL
NO 17 - LINTEL
PLAN VIEW AT TOP OF 6" RADIUS & SQUARE CORNER POSTS SHOWING THE CONNECTIONS BETWEEN THE LINTELS, TIE PLATES AND THE 6" RADIUS AND SQUARE CORNER PLATES
N.E.C. 12-18-45

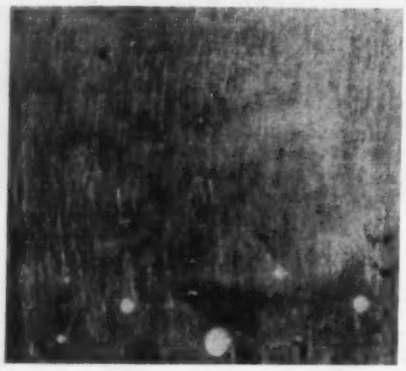
Metal

METHODS A

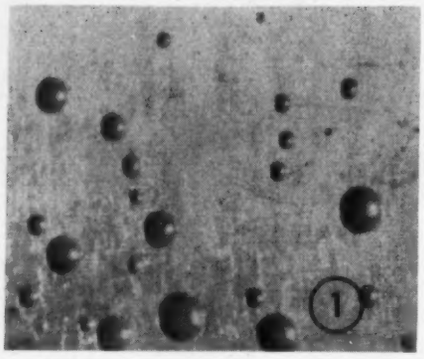
By JAS. ROWAN EWING
Assistant to President
Solventol Chemical Products Inc.
Detroit

Multiple-phase solution + water 1:60

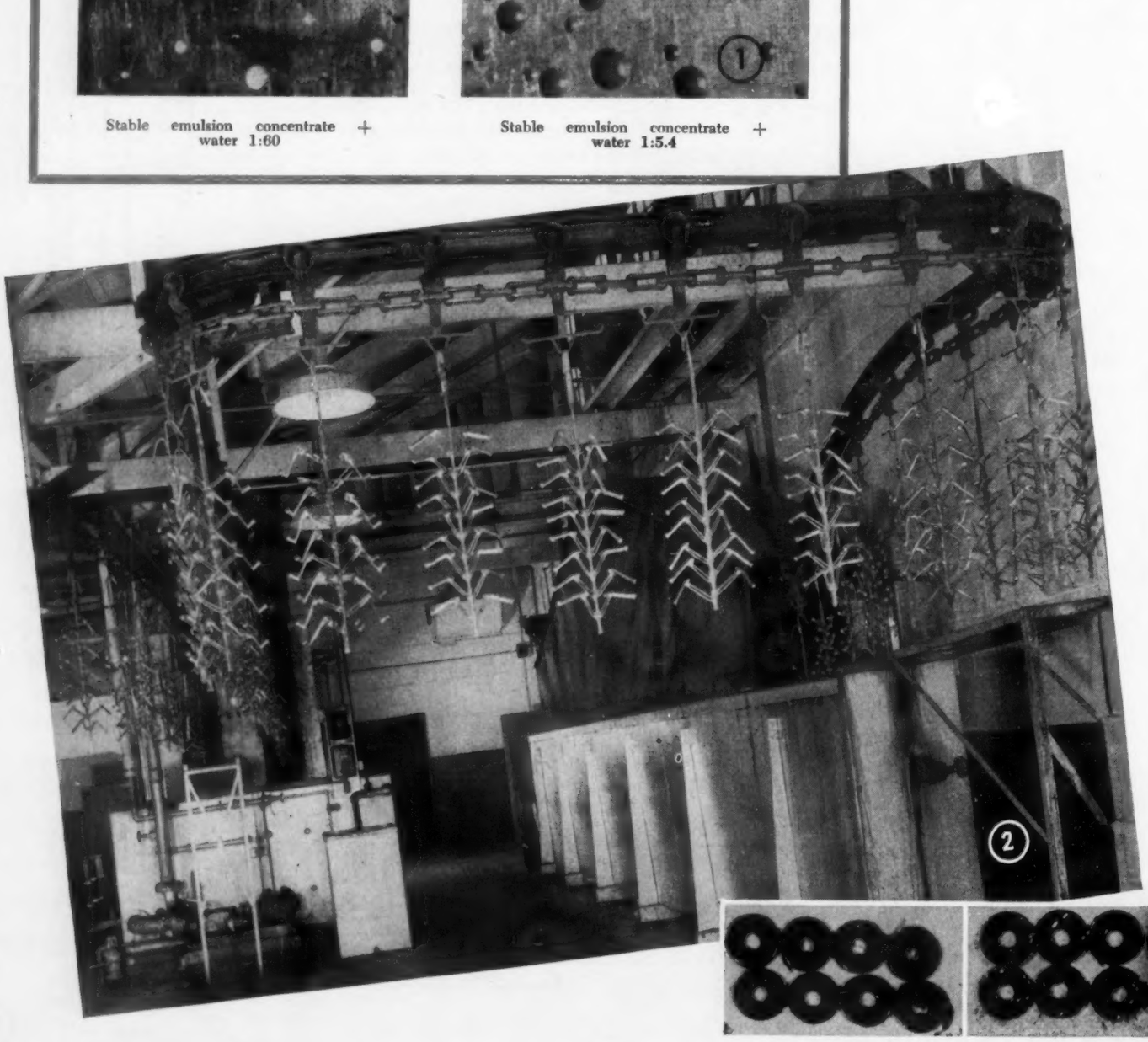
Multiple-phase solution + water 1:8



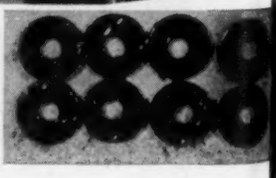
Stable emulsion concentrate + water 1:60



Stable emulsion concentrate + water 1:5.4



Water (Control)



0.1 per cent sodium oleate in water

l Cleaning—

S AND RESULTS

Mild alkalis, liquid hydrocarbons, chlorinated solvent vapors, emulsions of hydrocarbon grease solvents and water and multiple-phase type cleaners—each has a mission to fulfill

CLEANING prior to plating, phosphate coating or final finishing is a subject receiving more and more attention as the metalworking industry recognizes the importance of this step in the final quality of products. For years specific metal cleaning was not on the engineer's blueprint and as a result the so-called "cleaning" process was usually makeshift and inefficient.

Modern metal cleaning is gaining the stature of a science. A correlated development is the recognition of and provision for two basic classes of cleaning problems: (1) Ordinary and (2) quality.

Ordinary cleaning applies to those operations in which finish, tolerances, surface condition and appearances are not controlling factors. Examples include cleaning of rough castings prior to machining, cleaning of heavy framework or parts which do not contribute to the working efficiency or where appearance is unimportant. Quality cleaning, on the other hand, should be specified for all working parts, delicate metal surfaces, precleaning prior to finish or protective coatings, including plating.

For many years quality cleaning was obtained in the metals industry by the ingenuity of men rather than the processes available for use in metal cleaning. This will become more evident as we explore the cleaner types and materials and their applications. For a discussion of cleaner types, it is well to classify them first in two divisions: The first group comprises those whose primary function is to remove oxides or perform other stripping operations and to attack the metal surfaces by chemical reaction. These include acid cleaners, strong caustic solutions, and alkaline baths where an electric current is employed. In some cases, these cleaners have been relied upon to remove ordinary soil, but their greatest effectiveness has been in the removal of oxides and defective coatings to produce a uniform etching of the metal surface following other types of cleaning operations.

The second group would include those cleaning materials used for the removal of soil without attacking the metal surface, and it is this class that is covered below. The first of these, and still a very widely used cleaning material, is the mild alkali solution, which has as its principal virtue low cost. Some are satisfactory for what have been called "ordinary cleaning operations". Yet for many years, through ingenuity in industry, alkali cleaning has been employed where quality cleaning was required. To effect passable results, multiple rinsing or washing with mineral spirits or hand wiping was added. The multiple rinses are required to eliminate alkali residue which would tend to increase the atmospheric action on the surface or leave a surface unsatisfactory for inspection and final coating.

The second class comprises the liquid hydrocarbon solvents, such as kerosene, mineral spirits, or stoddard solvents. These are effective in removing oils and greases. Chlorinated solvents used in the liquid state avoid fire hazard but are more expensive.

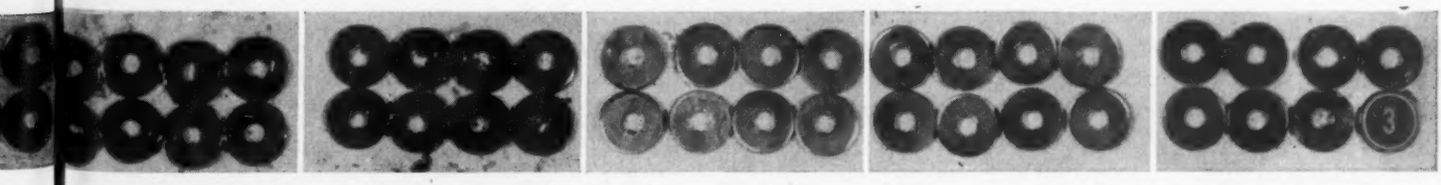
During the 1920's chlorinated solvent vapor cleaning was introduced. This method of cleaning found wide application in the metal working industry, chiefly because the cleaning was done by the clean condensed vapor which was distilled off the body of dirty solvent in the tank by relatively high heat. This feature of the vapor bath led to widespread application despite the high cost of the solvent and the need for special equipment. There is not a cleaning problem in industry to which at some time vapor degreasing was not applied or tested. Where soil on the metal surface consists of light grease or oil with no inert or water-soluble materials, particularly on minute parts, or where the prime consideration is a warm, dry surface, vapor degreasing is most successful.

Next class of cleaners comprises emulsions of hydrocarbon grease solvents and water. Until 1930 all emulsion cleaners were soap emulsions, with little cleaning efficiency. Emulsion-type cleaners, (*Please turn to Page* 140)

Fig. 1—Tinned plate test panels dipped in dyed solutions to demonstrate wetting efficiency of multiple-phase cleaning solution and stable emulsion solutions. Compositions prepared with red oil soluble dye

Fig. 2—Automatic dip and spray precleaning unit for cleaning die cast zinc base, steel and copper hardware prior to bright nickel and chrome plating

Fig. 3—Disks soiled with umber plus mineral oil, cottonseed oil and oleic acid, agitated with detergent solutions at 130° F



Stable emulsion concentrate + water 1:5.4 | Multiple-phase solution + water 1:8 | Multiple-phase solution + water 1:8 Stabilized by colloid milling | Stable emulsion concentrate + water 1:30 | Multiple-phase solution + water 1:30

Engineering Approach to *Materials*

IN GENERAL, where mechanical equipment can be used to augment human labor in materials handling, the cost rate per hour for equipment is but a fraction of the cost rate per hour for labor, while total work performed is many times more in units of work. Yet industry has been slow to adopt methods for effectively and economically handling materials.

Comparison of industry's past achievements in supplying tools to the production worker against tools supplied for the "non-producing" worker shows a definite balance in favor of the production worker. The result is that today we have have relatively unskilled machine operators producing and earning many times more per hour than the most highly skilled mechanics of a few years ago. The principle of "transfer of skill" (the use of tools that enable the unskilled operator to "reproduce" with equal accuracy many times more pieces per hour than could the skilled mechanic by older handicraft methods) has been applied. On the production line it has paid off in dividends and real wages.

Materials handling from manufacturer to consumer accounts in some cases for as much as 80 per cent of the labor cost of the finished product. A reduction in handling costs of even one-half or one-quarter of this amount would mean $40 or $20 off the cost of a $100 item. Such a saving would be a great boon in these times. Moreover, it can be attained by improved materials handling.

For the plant as a whole this problem is frequently being approached through 3-dimensional models such as shown in Fig. 1. Note ease with which the layout can be planned and the accuracy possible compared to other methods. But thoroughly detailed engineering of materials handling equipment must not be overlooked. The solution is not merely the combination of good plant layout with a haphazard collection of trucks, hoists and cranes.

Many firms have had the experience of buying a handling aid only to discover that it does not do the job expected. The hasty buyer fails to ask the primary question, "Is this the proper tool to do the job?" Correct analysis and engineering are the only solutions to the problem.

An ideal situation in any manufacturing process would be to have the product travel from machine to machine, or operator to operator, without any intermediate handlings. This could be accomplished if the operation cycle at each point were balanced. However, this happy condition is seldom attainable.

Here is a case example that (*Please turn to Page* 144)

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

MACHINE TOOL SHOW AHEAD: When this message, "Now it can be told!", was flashed to those of us who attended the Spring meeting of the National Machine Tool Builders' Association at Atlantic City, the big Machine Tool Show of 1947 ceased to be mentioned in whispers. From now on the industrial world in general is going to be made more "machine tool conscious" than ever before.

In the 12 years which have rolled by since the last National Machine Tool Show, more things have happened to upset the status quo of machine tool design than in any comparable period in industrial history. Up until the end of the war, however, the status quo was maintained to a large degree because the industry was under too much pressure to turn out the 1935 designs to permit any stoppage of production for infusion of sweeping new designs.

From the time the war ended until the Association—at its annual meeting in Quebec last October—finally decided to go ahead with a show in 1947—there was increasing emphasis on redesign. Since last October the machine tool builders really have been "turning on the heat" in their engineering departments.

Technological developments which have been accumulating since 1935 have been incorporated into new models now being given running tests behind closed doors of experimental rooms throughout the machine tool industry. Tools and attachments based on production experience gained under pressure of the war are being readied by tool engineers and production experts for application to the new model machine tools.

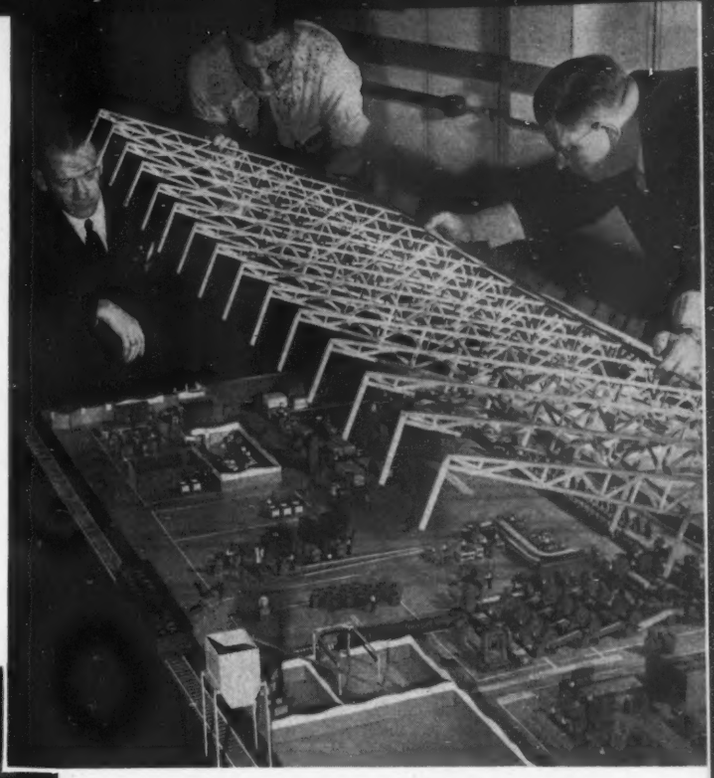
The machine tool engineers have been racing to catch up with the full possibilities of carbide tooling. At the same time the tool engineers have been striving with might-and-main to hold the lead which they gained during the war. This race can be compared to that between "engines and octanes" in the automotive industry— as a result of which the users got better automobiles quicker than otherwise would have been the case. By the same token, machine tool users are destined to get better machine tools quicker than otherwise would have been the case.

How immeasurably better many of these machine tools will be, will generally be realized only when the curtain rises on the National Machine Tool Show in Building No. 4 of the Dodge-Chicago plant, 75th street and South Cicero avenue, Chicago, on Wednesday, September 17, 1947. The show will continue through Friday the 26th. During that nine-day period attendance will be between

By R. W. MALLICK and
J. H. SANSONETTI
Manufacturing Engineering Dept.
Westinghouse Electric Corp.
Pittsburgh

Handling

There is no point to rushing in and buying equipment only to discover that it will not do the job expected. One company discovered that careful analysis is a better solution



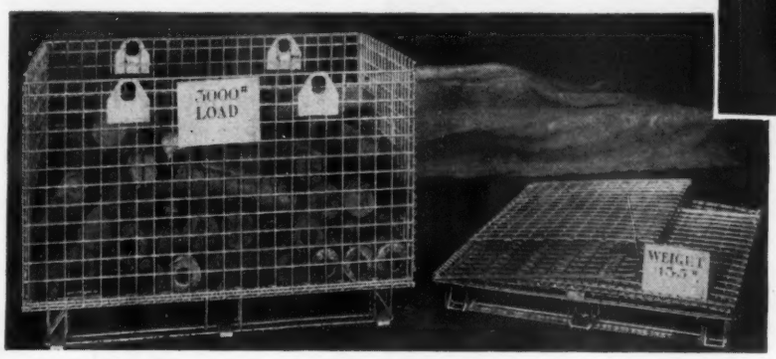


Fig. 1 (above)—Typical 3-dimensional layout of a modern intermittent manufacturing plant. Note ease and accuracy with which layout can be planned

Fig. 2 (left)—Final model of collapsible container as developed for field testing. Later improvements made it collapse fully

75,000 and 100,000 top management, production, engineering and financial executives. The general public will not be admitted.

Get busy now on your hotel reservations, through Joseph G. Fitzgerald, c/o Chicago Convention Bureau, 33 North LaSalle street, Chicago 2, Ill. Get yourself in condition to get around under your own power over 500,000 sq ft of floor space. Edward Payson Weston, champion walker, toughened his feet by soaking them in brine.

KNIFE SWITCH TO PUSHBUTTON: Rapid advances made by modern methods of electrical drive and control in machine tools—and their unhesitating acceptance today by machine tool users—are constant sources of surprise to all of us who recall the trials and tribulations of the "knife-switch-and-soapstone-panel" years of machine tool electrification.

I have just returned from the 11th Machine Tool Electrification Forum sponsored by Westinghouse Electric Corp. Every year since 1936 (except when cancelled by governmental ukase in 1945) this Forum has brought a large number of the best brains of the machine tool industry into close contact with a number of the best brains of the electrical industry.

Some of the results which I believe can be credited to no small degree to this meeting-of-minds are: Electrical engineering in machine tools now is far ahead of what it otherwise would have been; mechanical engineering of electrical equipment for machine tools also is far ahead of what it otherwise would have been; users are getting more productive and more dependable electrified machine tools than they otherwise would be getting; machine operators are getting more pay for doing easier work; and the public is getting better machine-made products for prices that still are within reason.

At the recent Forum, L. E. Osborne, vice president of Westinghouse, gave us some solid food for thought when he said: "The American workman can earn one day's food for his family by an hour and one half of work. The Russian workman must labor ten hours for the same result. In other words, the Russian worker has the benefit of only about one-sixth the mechanical power that is available to the American worker—consequently, he takes six times as long to produce an equal product.

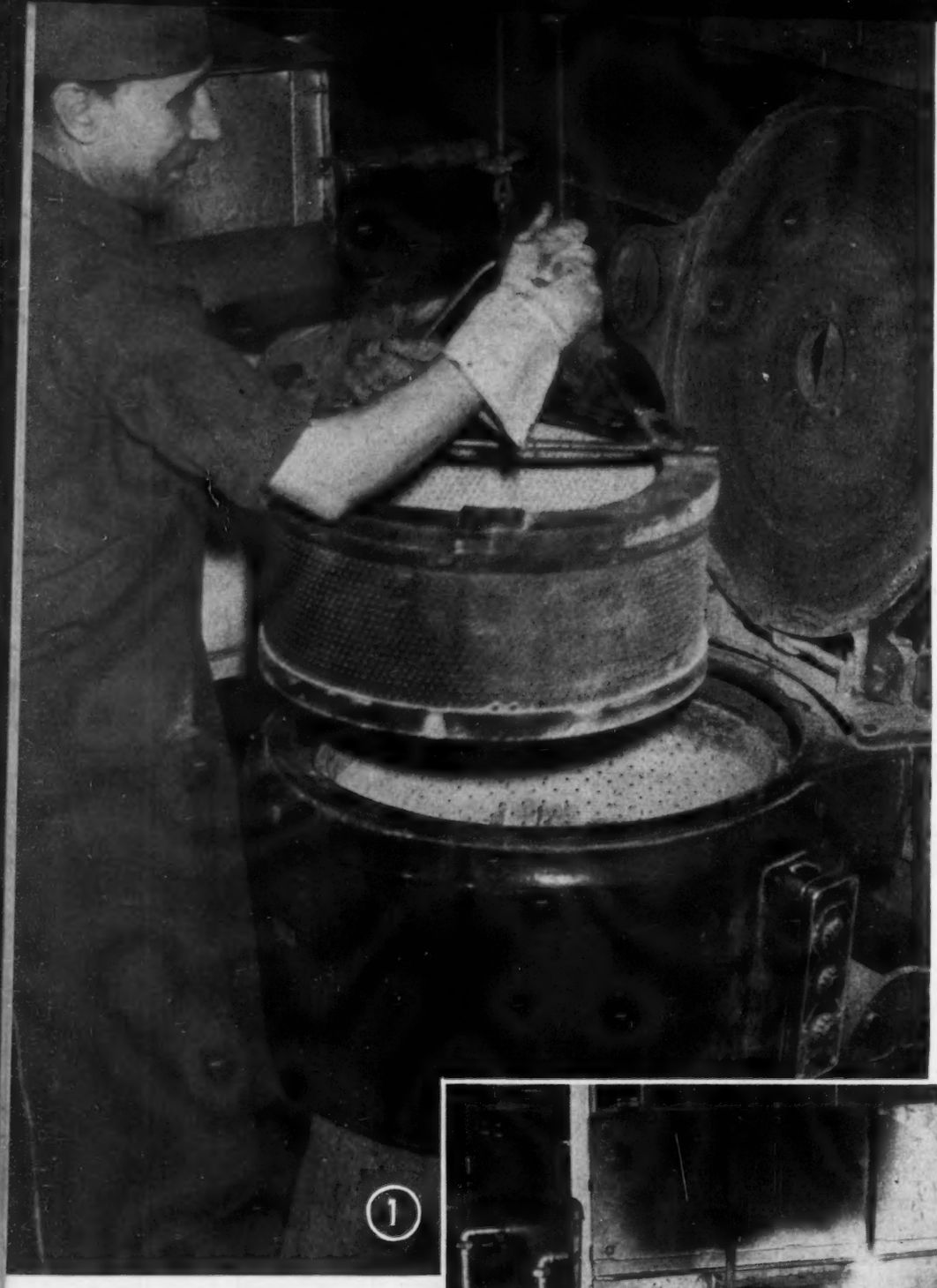
"These figures should be significant to those who find the way of life and government abroad more attractive and desirable than the American way. Unhappily, there is evidence that too many in this country are willing to toss overboard the industrial system that gave them the world's highest standard of living with the greatest individual freedom.

"Evidently they think that by putting business under government control they will eliminate the evils mistakenly attributed to the profit motive of private enterprise. Yet it was the profit motive which gave industry the initiative to venture, to risk, to progress.

"Right now, in the face of unsound pressures and dangerous trends, industry again is being called upon to do the 'impossible'—to produce more goods at lower prices while shouldering higher operating costs. Again industry looks to machine tool builders for the answer."

Heat

Integrated setup designed to heat treat, clean and apply finish to small stamped parts in batches ranging from a few hundred up to hundreds of thousands keeps pace, economically, with fast plant production



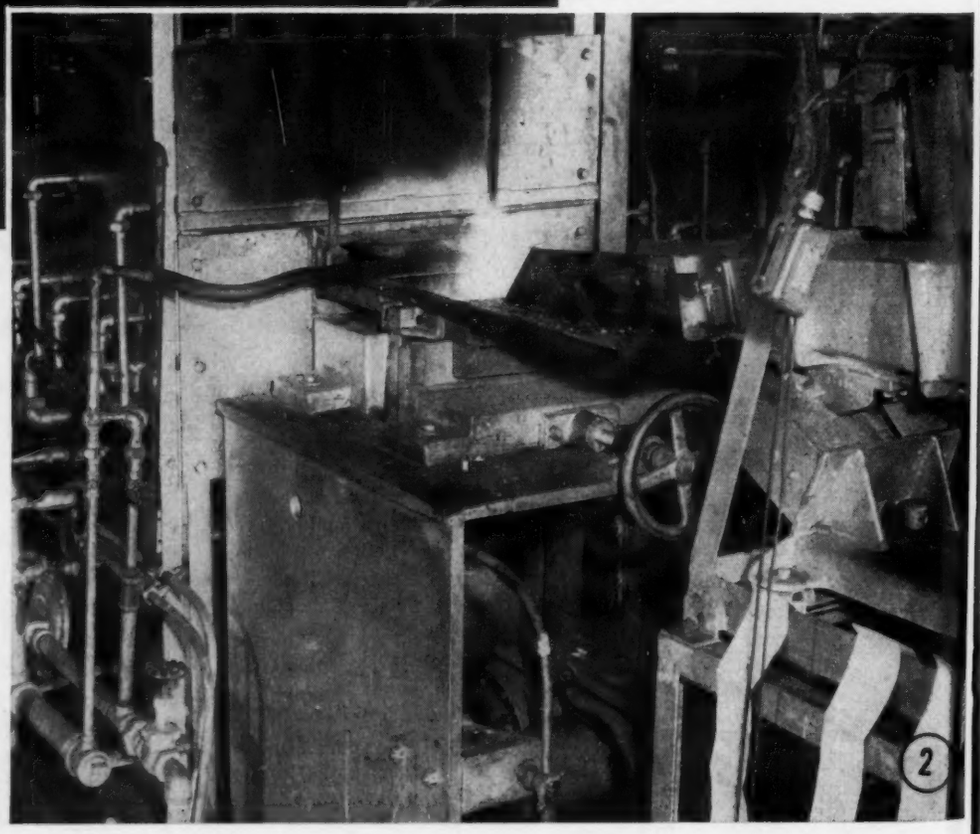


Fig. 1—Centrifuge in which baskets of parts are spun dry after coming from rinse

Fig. 2—Feed end of one of a battery of seven American Gas Furnace Co. tempering furnaces of the shaker type, showing end of hearth projecting through gas curtain

Fig. 3—After cleaning, nuts are Parkerized and then rinsed, after which they are centrifuged

Fig. 4—Preparing a load for one of the draw furnaces, left, work being handled in cylindrical wire baskets of various heights

By HERBERT CHASE

Treating Fasteners

BY THE MILLION

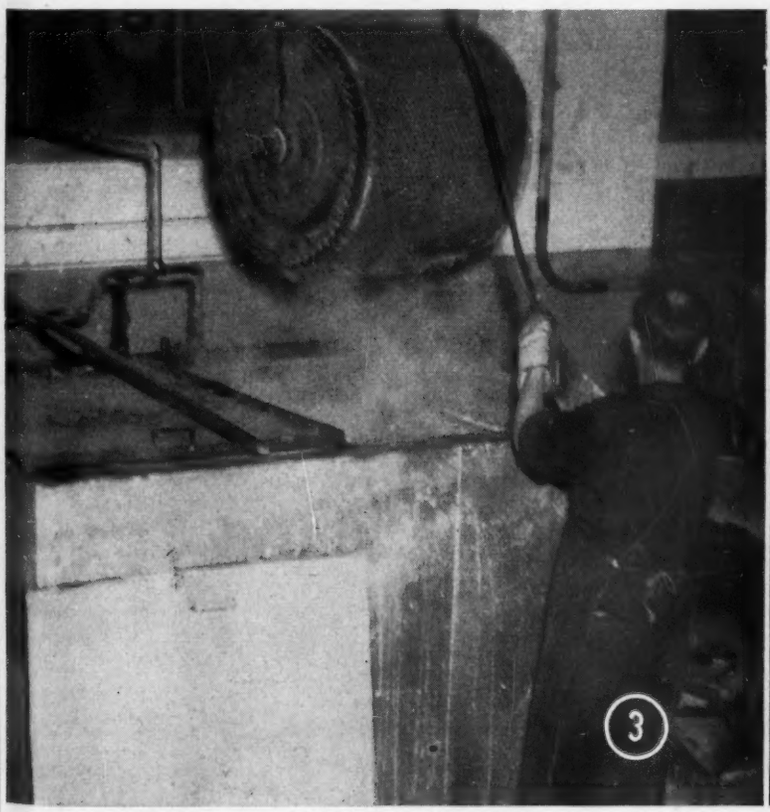
TO heat treat and apply a lasting finish to small stampings on a large volume basis necessitates well-ordered setups if required quality is to be maintained and costs are to be held within desired limits. Such results are attained by Tinnerman Products Inc., Cleveland, in the daily manufacture of Speed Nuts and Speed Clips. These products are stamped or made on wire forming machines, or both, in several thousand diversified shapes and sizes. The individual parts run from several hundred per pound upward but are classed as small stampings in most instances.

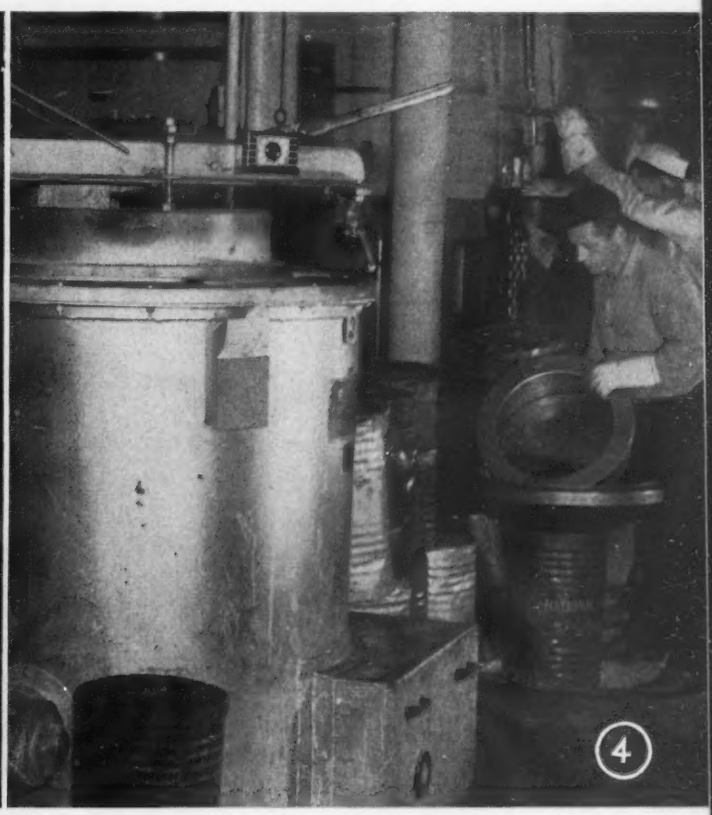
Batches range from a few hundred, for experimental or short-run items, up to hundreds of thousands. Not a few fasteners are ordered in million lots or come through continuously for days at a time. Although numerous types and grades of materials are used, all but a small fraction of the total production is in SAE 1060 carbon steel.

Handling in the heat treating department is mostly in wire baskets of uniform diameter to fit cylindrical draw furnaces and other equipment. Baskets of various depths are chosen to suit the size of batch; each basket carries an identifying tag with spaces for a record of the exact treatment applied.

Before heat treatment starts, however, all parts are passed through degreasing tanks, Fig. 6, using trichlorethylene. This is at boiling temperature in the first dip tank and only slightly warm in the cleaner rinse solution. In the final stage of cleaning, the basket is suspended in the vapor above the tank. There, vapor condenses on the parts and drips off leaving surfaces clean and parts ready for heat treating. Total cleaning time is 4 to 5 min, the baskets being handled by an electric trolley hoist as for other subsequent shifting.

A battery of seven heat treating units is now in use. Two of these are neutral salt-bath types, and the others





are continuous gas-fired shaker type American Gas furnaces. Batches of parts in the salt furnaces are handled in baskets. Each batch remains in the bath 5 min and attains a temperature of 1525° F. Baskets are pivoted for lifting and dumping by a hand crank into the oil quench.

Quenching is followed by a warm rinse in running water and then by a treatment in alkaline cleaner in a squirrel-cage basket to remove any remaining salts and quench oil. This is followed by a dip in soluble oil at 150° F. Baskets of parts are then dried on a gas-heated table before being shifted to draw furnaces.

In the shaker furnaces, Fig. 2, parts are fed from a hopper by a Syntron vibrator control at a rate which is varied to suit the size and thickness of parts being fed. They drop onto the shaker hearth along which they are advanced by the shaker action. This hearth is preferred because many parts are quite small and would tend to catch in or adhere to a wire belt. The rate of shake and of advance along the hearth is varied by a Rees drive on the shaker mechanism.

A slightly reducing atmosphere is maintained by feeding in natural gas at the muffle through which parts are discharged into the oil quench tank. Although the hearth projects from the furnace at the feed end, air is excluded by a gas curtain through which the parts pass as they enter the furnace.

Passage through the furnace requires an average of 4 min; parts attain a temperature of 1550 to 1575° F. Discharge takes place automatically and continuously, a few parts at each shake. Parts fall into the quench through a muffle, lower end of which dips below the oil level so that no air can enter there.

The oil quench is kept in circulation and parts fall through a spray of oil before dropping through the oil in the tank into a collection basket. Continuously cooled oil is held at 110° F. Baskets of parts are allowed to drain and then are degreased. In some cases, the parts are centrifuged before being degreased in preparation for transfer to draw furnaces.

For tempering and drawing, Lindberg and Eclipse draw furnaces are used, the wells being filled with cylindrical baskets often of varying height to handle different loads, Fig. 4. These furnaces are held at 700° F, and each charge remains from 60 to 75 min, after which the baskets with load are removed and batches are set aside to cool 30 to 60 min before any finish is applied. Every batch is tested for rockwell C-scale hardness which is held at 60 to 65 before drawing, and at 46 to 48 after drawing.

Although numerous customer specifications are followed in finishing fasteners, all save a small proportion of the total volume is given one of two types of finish that Tinnerman has found to be well suited to meet a wide range of requirements. One includes Parkerizing, Fig. 3, followed by drying by centrifuging and then by a dip in phenol-alkyd resin and wax. Another centrifuging to remove excess finish precedes air drying. This yields a black finish satisfactory for many types of service but one less resistant to corrosion than the No. 1 finish.

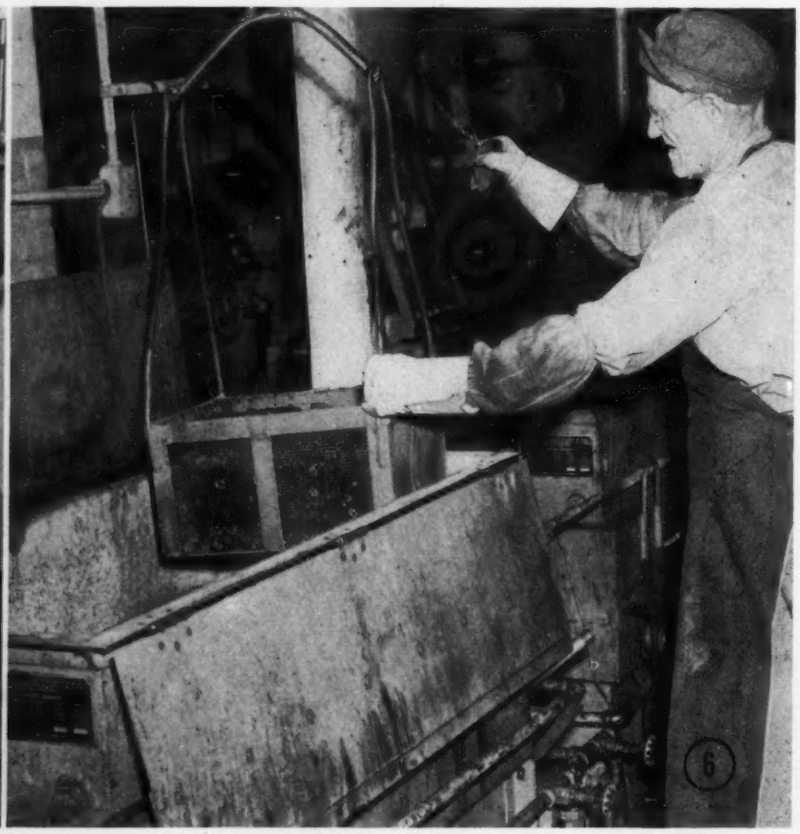
For the other finish, parts are first Parkerized; next centrifuged in an electrically heated dryer, Fig. 1, and then given two dip coats of zinc chromate paint applied in a baking type of alkyd resin vehicle, with baking between coats, the finish being termed Glidden "spinning green." Both coats are applied in a Ronci painting machine, Fig. 5, having a work basket that is at the top of a spinner enclosure.

After loading the basket and setting it in place, a tank of the finish below the basket is elevated until the work is fully immersed in the finish which flows to coat all parts therein. Then the tank is lowered and, with the loading door

(*Please turn to Page* 148)

Fig. 5—Placing baskets of nuts in Ronci machine in which they are first dipped in zinc chromate finish and then are spun to remove excess finish before baking in oven

Fig. 6—Load of parts being withdrawn from the Detrex degreaser preparatory to heat treatment. Same treatment follows quenching



Application of Oxygen for

Refining Low Carbon Heats

Savings effected by oxygen lance for removing carbon from the bath are nearly the same as those secured from oxygen-enriched air though consumption of oxygen is much lower. Oxygen with purity of 95 per cent may be produced for $0.18 per M cu ft

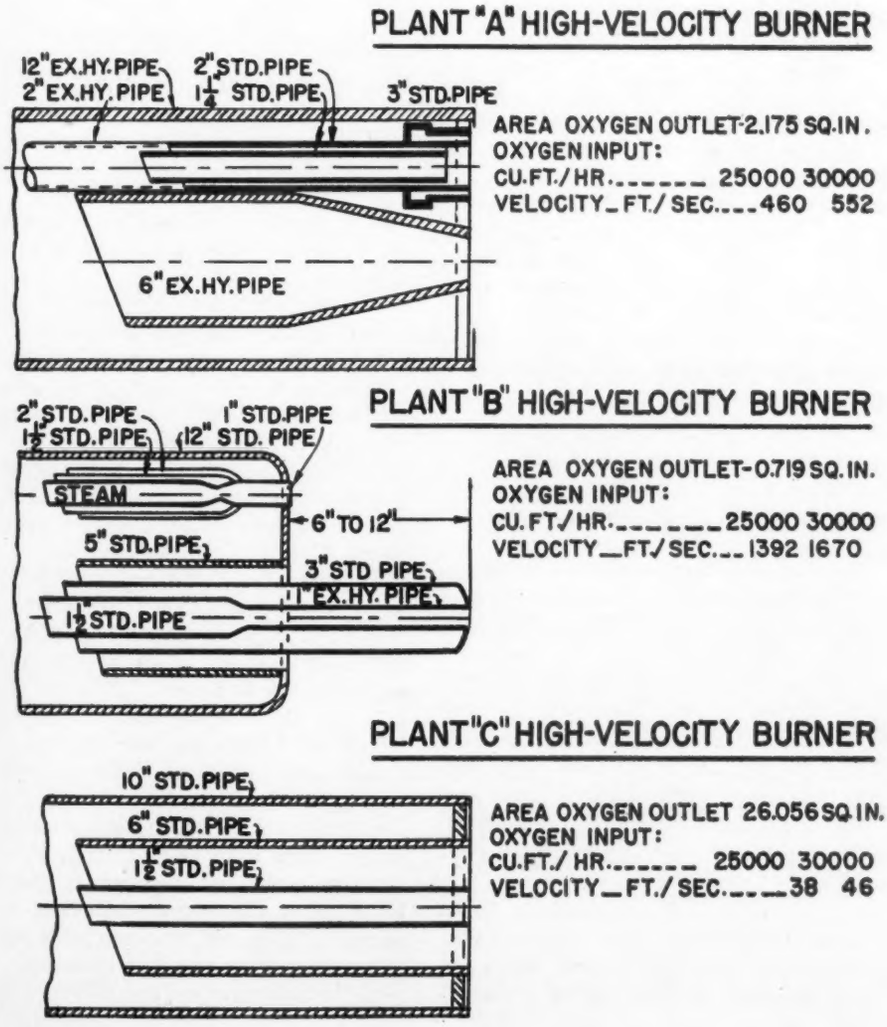
CONSIDERING the amount of oxygen available, the price of oxygen and the charging time of open-hearth heats, the greatest benefit at a reasonable cost is by the use of oxygen for refining low-carbon heats. This fact, based upon innumerable tests, was brought out by E. B. Hughes, foreman, Open-Hearth Metallurgy, Steubenville, O. Works, Wheeling Steel Corp., at the 30th conference of the National Open Hearth Steel Committee and the Coke Oven, Blast Furnace and Raw Materials Committee of the American Institute of Mining and Metallurgical Engineers, Netherland Plaza hotel, Cincinnati, April 21-23.

Mr. Hughes, whose paper "Finishing Open Hearth Heats by the Introduction of Oxygen into the Bath" won the McKune award of the Open Hearth Committee, described what could be done right now in a practical way with the supply of 1,000,000 cu ft of oxygen per month at $3.35 per 1000 cu ft ($80.40 per ton).

The process of direct oxidation, he explained, has been carried out by introducing oxygen at about 100 psi into the bath by means of pipes through the wicket holes.

Extremely low-carbon heats can be made with creditable heat time if the furnaces are built, production planned and men trained with this product in mind. Under conditions at his plant, Mr. Hughes pointed out, it requires from 2 to 2½ hours to work a heat from 0.10 to 0.04 per cent carbon by conventional methods. There is also some difficulty in keeping the bath hot at these low-carbon contents. Therefore, the heats to finish under 0.07 carbon offer the best possibilities of saving time easily.

Heat log shows carbon is oxidized rapidly with a slow-buildup of oxygen. As the carbon oxidizes, the temperature increases until a point is reached between 0.06 to 0.07 per cent carbon where both carbon and manganese react slowly. At this point more iron is oxidized which increases the FeO in the bath and slag resulting in a high enough value



Combination burners equipped with oxygen outlets

Operating Data for Open-Hearth Furnaces Using Oxygen-Enriched Combustion Air

Plant	No. of Heats	Type of charge	Oxygen Input M cu ft/hr	Oxygen Input cu ft/ton	Percent Savings time	Percent Savings fuel
A	10	45% Hot metal	25	468	21.7	15.2
	11	45% Hot metal	30	525	17.6	6.5
	10	65% Hot metal	25	369	9.6	2.7
	10	65% Hot metal	30	386	2.8	−5.3
B	4	Cold Charge	9-18	684	22.6	18.7
	4	55% Hot metal	9-18	326	24.1	11.2
	7	70% Hot metal	9-24	369	14.8	6.8
C	5	40% Hot metal	30-60	746	30.0	17.0

that reaction occurs between FeO and C, and FeO and Mn thereby allowing the C-Mn drop to proceed again. Keeping the end of the pipe from 6 to 10 in. below the surface of the steel gives the most rapid carbon drop with the lowest oxygen consumption. With a bath depth of 30 in. there is sufficient steel below the end of the pipe to protect the bottom from the possible effects of the oxygen. At this depth the pipe burns at the rate of 2 to 2½ fpm. A length of standard 3/4-in. pipe lasts about 6 min. The depth to which the pipe is inserted below the metal surface has a direct bearing on the oxygen efficiency.

Carbon content has an important effect on the rate of carbon drop which must be considered in estimating the effect of direct oxidation. Regardless of the source of oxygen, the carbon drop is faster at high-carbon content than later in the heat when the carbon is lower.

A published estimate that is believed to be representative gives $60.00 an hour as the increase in total cost accompanying an increase in furnace time. Accepting this for comparison, the use of 18,000 cu ft of oxygen at $3.35 per 1000 cu ft is repaid by the saving of 1 hour in the furnace time.

Investigation indicates that the physical properties are unaffected by the source of oxygen when working a heat. The time required for ore to clear is greatly decreased. Lime is taken into solution rapidly. Cold heats and the accompanying troubles can be avoided easily. One of the noticeable characteristics of direct oxidation is the heating of the bath. Benefits include less loss of yield due to skull and pouring trouble, improved quality and saving of time and additions such as 15 per cent silicon spent in trying for temperature.

Specified analysis can be easily met particularly in low-carbon heats under 0.08 carbon.

Ore heats require an average of 2 hours and 35 min and 12,000 lb of ore to get 0.10 per cent carbon to tap. The same results were accomplished in not over 50 min by blowing the bath with 7000 to 20,000 cu ft of oxygen. The fuel saving was sufficient to pay for the oxygen. The difference in the total heat time was 50 min.

Oxygen heats have a slightly smaller skull. Five ore heats had from 2000 to 4000 lb skull whereas four oxygen heats had from 1000 to 2000 lb skull. Ingot yield is 88.9 per cent for direct oxidation compared with 85 per cent for ore heats.

In conclusion Mr. Hughes stated his observations show that the practice effects a saving in heat time, an increase in temperature and a saving in fuel related to the bath, faster heats and higher temperatures.

Data brought out by various open-hearth operators concerning the use of oxygen, follows:

At a shop in the Great Lakes district oxygen is fed into the hearth through a 1-in. pipe located beneath the oil burner. The furnace charge is 80 per cent hot metal and 20 per cent scrap. Oxygen heats carry lower sulphur content. About 1000 cu ft of oxygen is used per ton of steel; the melting rate is about 14 tons per hr. Installations of washing equipment has been instrumental in removing 80 per cent of the iron oxide fumes.

Decarburizing Rate Varies

At another plant where the carbon reduction is effected by the use of oxygen the decarburization above 1 per cent carbon is slow whereas that from 1 to 0.20 per cent carbon is slightly faster. Slag from oxygen heats is rather fluid and maximum efficiency is obtained after the slag is shaped up. Savings in heat time average from 30 min to 1½ hr. Indications are that quality of steel is better with oxygen heats.

At a shop in the Chicago district experiments are being made with jets through which oxygen is released 6 in. above the bath. Results show that it opens up the slag and gets the gas to the steel. Considerable fumes are driven off. Drop in the carbon content amounts to 2 points per min starting at 0.20 per cent carbon. Results also show that sulphur is reduced with the introduction of oxygen.

Warning was voiced by one operator that gas washers would have to be installed where oxygen-injected heats are made particularly where the open-hearth shop is located near the residential district.

J. J. Golden, Carnegie-Illinois Steel Corp., Gary, Ind. in discussing from the combustion standpoint various types of oxygen burners at three different plants (see accompanying illustration), drew attention to the wide variation in the areas if the oxygen outlets, which result in appreciable differences in oxygen velocity at any given rate of input. Inasmuch as the input rate, the velocity, and the total time used, determine the amount of oxygen consumed, it is evident that careful consideration must be given to attaining the optimum oxygen velocity and flow in order to achieve the maximum savings in time and fuel.

From the operating data shown in the accompanying table, it appears that the greatest saving in time and fuel was obtained with the low-velocity burner used at Plant C. In this case, the total oxygen consumption is considerably higher than with any of the high-velocity burners. It is doubtful whether the increased savings resulting from the use of such a high volume of oxygen is in proportion to the increased oxygen cost.

From the data shown for plants where various types of charges are used, the savings in time and fuel decrease as the percentage of hot metal in the charge increases. It is probable that with hot metal charges over 60 per cent of the savings would not be sufficient to warrant the use of oxygen.

Although data were obtained only on a few heats, it is evident that, with oxygen-enriched air, high luminosity in the first and second doors indicates fairly complete combustion taking place in this zone, while on the outgoing end of the furnace the flame radiation with oxygen-enriched air is lower than with normal combustion.

At present, it appears that the savings in time and fuel resulting from the use of oxygen lance for removing carbon from the bath are almost as great as the savings from using oxygen-enriched combustion air, with a much lower oxygen consumption; and further experiments may show that, in the long run, the oxygen lance might be the more economical of the two methods.

P. C. Keith, president, Hydrocarbon Research, Inc., in describing plant facilities for the manufacture of oxygen mentioned that a plant designed for the daily production of 100 tons (2,400,000 cu ft) of oxygen with a purity ranging from 90 to 96 per cent would cost $940,000. Such a plant, he declared, would supply oxygen at a cost of 18 cents per M/cu ft. He directed attention to the fact that only two men are required to operate any size plant; little maintenance is involved.

Power costs in the manufacture of oxygen range from 11 to 15 kwh M/cu ft. Top compressor pressure is about 68 lb. Cost of oxygen production, he stated, is influenced by power costs and this in turn by compressor operation.

(*Please turn to Page* 150)

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Engineering News *at a Glance*

BIG "SKIN GRAFTING" JOB: Biggest job to date in aluminum metalizing was completed recently in St. Louis, it was revealed by John Nooter Boiler Works Co. Nooter workers just finished spraying pure aluminum "skin" on some 63,000 sq ft of structural members for the Missouri Pacific's new $10,000,000 Sunshine Eagle streamliners. The "skin" is said to impart corrosion proof quality of aluminum to the strong copper-aluminum beams used as structural members. The "skin-grafting" job, termed a significant process in the manufacture of railroad equipment, was put in operation on assembly line basis by the company. The spraying process was devised by Aluminum Co. of America.

BIG POWER INTERRUPTION: In Pittsburgh, Westinghouse Electric Corp. reports a new record was recently established in short circuit power handled by a high-voltage circuit breaker. The entire output of the six 108,000 kva generators at Grand Coulee dam, together with back feed over six 230 kva transmission lines from the Bonneville Power Administration system and the Northwest Power Pool, was poured into a tremendous short circuit test on a new oil circuit breaker. The fault power approximated 7,500,000 kva on a 3 phase basis, and was interrupted successfully twice within a 15 sec interval.

SETS UP OUTLETS: In Newark, N. J., Ralph Hochman & Co. revealed it is appointing agents throughout the country to introduce nationwide a new line of polishing lathes for platers, foundries, tool rooms and laboratories. The company already is in process of marketing the first model in the line—the forerunner of a quintet of lathes of varying sizes and types planned for early delivery under the trade name of Washed Air. The name stems from the dust collecting unit incorporated in the lathe which cleans dust-laden air by passing it through water.

MARKETS LUBRICANTS: From Boston, Tracy Langdon, president, reports his organization, Machinery Lubricants Inc., is now organized to market nationally a limited number of original industrial lubrication developments to the metalworking industry. Faced with a shortage of synthetic materials used in its products —all wartime developments—the company only recently was able to attain volume production. Feature product turned out by the concern is a cutting and grinding compound, a nonpetroleum synthetic cutting oil, which is said to mix easily with water of any degree of hardness, and to offer a true solution of genuine transparency. According to the company, some 42 industrial supply distributors, located in principal metalworking centers, are now handling its products.

TAKES OUT THE TWIST: Operators using skull crackers to break scrap and slag know the common trouble with the hoist rope is not so much the shock and torque attendant to lifting and dropping the hammer as is the tendency of the wire rope to twist and kink when suddenly released of all tension by the "ball" hitting the material. Although much of this difficuty can be overcome by the use of preformed wire rope—preforming frees component wires from locked-up torsional stresses to reduce tendency to twist—one operator eliminated the twist in the rope entirely by using ordinary welded chain as the rope terminal. The chain takes the sudden slack without twisting, holding the line steady, free of all tendency to twist or kink.

MAGNESIUM TRUCK PARTS: Though magnesium, lightest of metals, still is prohibitively expensive for most automotive manufacture, it can and is being used in a few instances, *Automobile Facts* reported recently. One firm now offers prefabricated magnesium truck-body parts, ready for assembly. A Western bus operator recently road tested a 60-ft bus with a body of 65 per cent magnesium and 35 per cent aluminum.

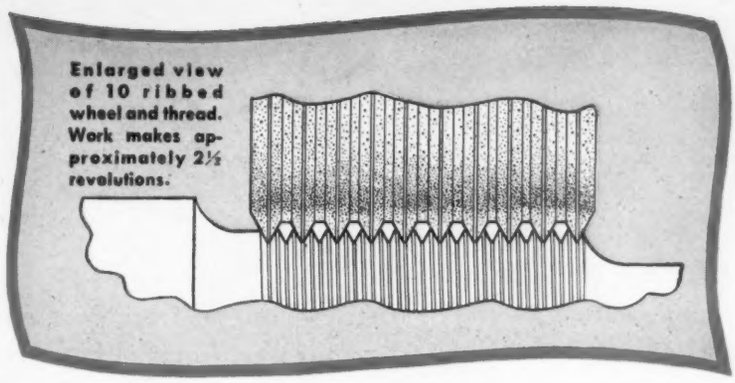
SULPHURIC ACID SOURCE: Recovery of sulphur in form of sulphuric acid now is possible through a new process in commercial use, it was learned at the American Chemical Society meeting in Atlantic City. Large amounts of sulphuric acid are consumed regularly by coke plants and steel mills, thus the new process serves the combined purpose of eliminating sulphur-bearing wastes, improving gas for steelmaking purposes, and making the industry independent of outside sources of suphuric acid.

STIMULATES PRODUCTION: One way to stimulate production, reduce fatigue, errors and accidents is to see that plant workers get plenty of fresh air, Ilg Electric Ventilating Co. of Chicago, points out. This is doubly important during hot weather months. Quickest, most economical way to gain this objective, the company states, is to install a night cooling system similar to the attic fan setup used in homes. Such a system draws fresh, cool night air in from the outside, circulates it through the plant then exhausts it along with daytime heat, smoke, odors and bad air. Temperatures inside the buildings are reported to be lowered from 15 to 20°. The company now is making free surveys for plants seeking such a system.

REVISES ELECTRICAL UNITS: Revised values of the units of electricity and of light are to be introduced by the National Bureau of Standards as of Jan. 1, 1948, it was learned recently in Washington. While definitions of units and methods of fixing their magnitudes will differ from present practical systems, the changes in magnitude are so small as to affect appreciably only measurements of high precision. The bureau reports that in certificates for standards and instruments issued during 1947, values will be given in both old and new units.

OBTAINS COATING PATENTS: In New York, it was learned recently, R. D. Wasserman, president, Eutectic Welding Alloys Corp., was granted two United States patents to apply a metallic coating, called Eutectofilm, to the line of low-temperature welding alloys manufactured by the company. The concern revealed the coating is applied to bare welding rods to improve welding characteristics, insure high physical properties of the weld deposit, assist in surface alloying at low base metal heats and to protect filler rod from corrosive attack.

FORMS WATERPROOF FILM: New type of back, cold-applied protective coating, soon to be made available generally, can be applied to damp surfaces of metal, concrete or masonry. Developed by Wailes Dove-Hermiston Corp., Westfield, N. J., subsidiary of Koppers, the coating is a dispersion in water of highly-refined plastic coal tar pitch and other materials. The company reports the product, which can be applied by brush or spray, dries in form of a tough film in 15 min, and is impervious to water. It does not alligator in sunlight, has no melting point and does not sag or flow at temperatures below 500° F. The material resists very low temperatures without cracking, and can be thinned with cold water. It also seals out moisture effectively when used as an insulation.



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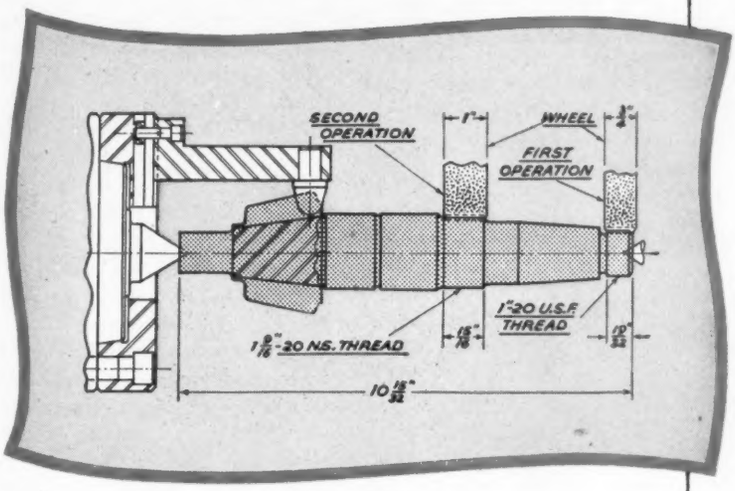

ON AXLE DRIVE PINIONS

"PRODUCES NEAR PERFECT THREAD"

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"NO MARRED THREADS ON THE ASSEMBLY LINE"

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The Timken Detroit Axle Company, prominent manufacturer of heavy truck axles, has this to say about a Jones & Lamson Automatic Multi-Ribbed Thread Grinder installed to grind the threads on axle drive pinions.

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In One Operation

Special multiple spotwelding unit welds and "resistance rivets" 26 studs and clips to a stamped steel frame in less than 20 seconds, assembling record changers in "record" time

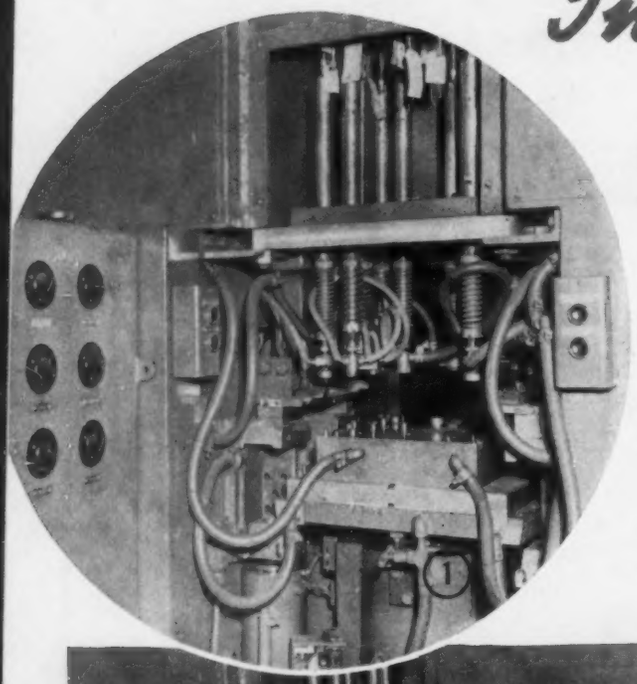

Fig. 1 — Closeup of machine's throat showing how each electrode functions as an independent welding unit. Telephone-jack type control board is located at left of throat

ENGINEERS of J. P. Seeburg Corp., Chicago, recently came face to face with this problem: It was necessary to greatly increase production of automatic record changer panels with the limited floor space and handling facilities available. These panels are stamped sections of mild steel to which must be fastened numerous small studs, clips, etc., to support the intricate record changing mechanism, under side of which is shown in Fig. 5.

Two standard types of record changers are made by the company. The smaller of the two units requires 19 parts, the larger unit 26. The latter includes four projection welded studs to hold corner springs, three spotwelded clips—one requiring two welds—and 19 small studs of varied size and shape. The engineers considered the possibility of producing this complicated assembly in one operation as a means of cutting down manhours and saving needed floor space.

To meet and solve the problem, a multiple welder, capable of fastening all of the parts of either unit in a single operation, was recommended by designers of Sciaky Bros. Co., Chicago, builders of the machine. Now in operation, this machine, shown in Figs. 1, 2 and 4, has proved to effect not only a 50 per cent savings in manhours and a sizeable reduction in floor space and handling time, but also an increase in strength and quality of the finished job.

Six operators, using the equipment formerly used, were able to produce

Fig. 2—Operator in foreground is loading specially designed jigs (also shown in background in Fig. 3) while other operator places jig on lower platen of welder and releases the parts in position

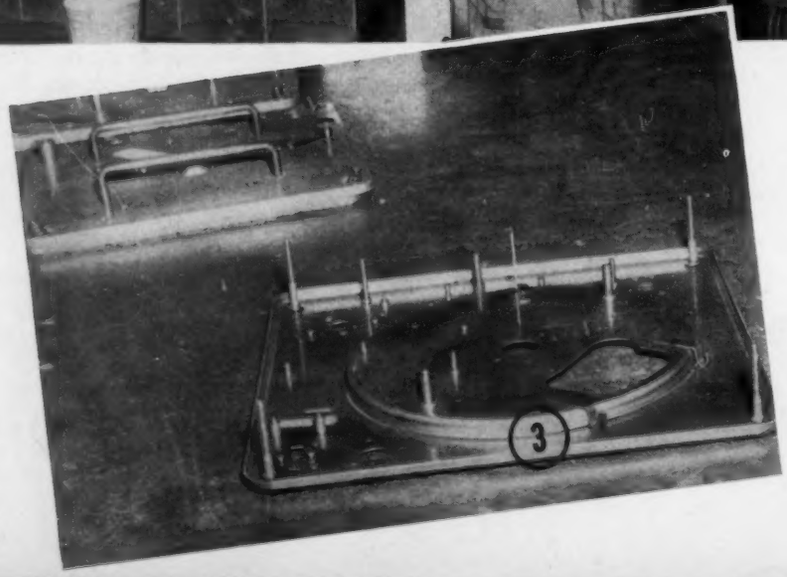

Fig. 3 — All 26 studs and clips of varying sizes welded into place on record changer panel in foreground. In background is jig of type used to load studs and clips into the spotwelding machine

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IN ANY APPLICATION where studs are used, "LOK-THRED" Studs will lock more securely and prove stronger in both tension and torsion than American National Threads.

The "LOK-THRED" design avoids the chief weakness of ordinary interference fit, which places the metal of the receiving thread under shear and thus tends to cause a bursting or splitting action.

Note these other important advantages of "LOK-THRED" which are explained fully in the new booklet pictured here:

1. **Modified American National Thread permits use of standard tools. (Page 6.)**
2. **Does not require selective fits. (Page 6.)**
3. **Locks securely and becomes tighter in service. (Page 9.)**
4. **Carries entire normal working load on 6° angle at root of thread under high compressive prestress. (Page 11.)**
5. **Does not gall when being driven nor fret in service. (Page 12.)**
6. **Stronger in both tension and torsion than ordinary American National Threads. (Page 12.)**
7. **Has much higher fatigue limits than studs with conventional threads. (Page 13.)**
8. **Acts as dowels and taper pins. (Page 16.)**
9. **Seals positively and eliminates added bosses and blind tapping. (Page 17.)**
10. **Re-usable and on any re-application less than one-half additional turn brings torque back to its original installation value. (Page 17.)**

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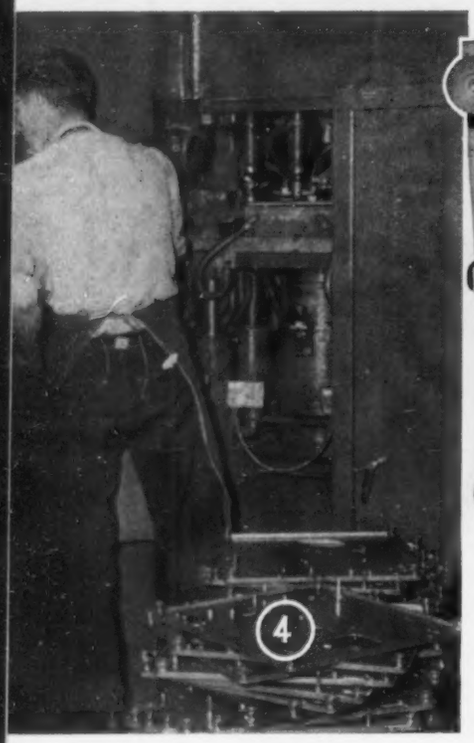

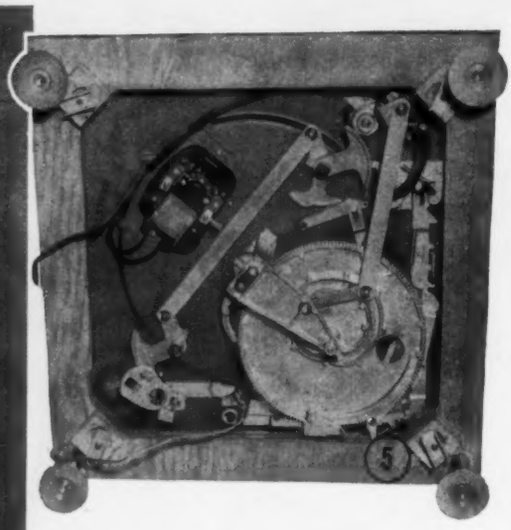

Fig. 4—Operator on opposite side of machine from Fig. 2 places panel in position and actuates switch which initiates approach stroke and welding sequence. Entire assembly is completed in less than 20 sec

Fig. 5—Underside of completed Seeburg automatic record changer, showing intricate changing mechanism

1500 large record player assemblies per day. With the installation of the multiple spotwelder, production was increased to 1600 units per day with only five operators. According to the company, man-hour costs for this assembly were more than halved. Actually the multiple welde accomplishes eight operations in one, with a savings in moving work pieces from station to station, as well as in actual joining time.

The finished panel, as multiwelded, was found to be considerably stronger and rejects were reduced to a negligible number. A tighter, stronger joint was produced by the hot upsetting action, this applying to the studs in particular. The majority of these are "resistance riveted" rather than projection welded for locating purposes. The electrodes both fuse and upset the stud in place. The multiwelded operation also assures all studs to be exactly 90 degrees to the panel—a factor which was difficult to control under former assembly methods.

An open-throated assembly of individually controlled welding guns best describes the multiple spotwelding machine built by Sciaky. Transformers and control equipment are compactly mounted on either side. Fig. 1 shows closeup of throat of machine.

To begin operation, the 26 small parts are placed in a locating jig by one operator while another is placing a similarly loaded jig over the machine's retractable lower platen. Releasing of jig allows all parts to drop into the lower dies. This operation is being performed in Fig. 2. In the meantime, a third operator on the other side of the machine is placing a panel in position, as shown in Fig. 4. This third operator presses a switch which actuates an air cylinder, moving the platen up until a contact is made with the conductors from the transformer, with the shaped-to-fit-the-parts upper electrodes completing the welding sequence. A completed top panel is shown in Fig. 3, with parts loading jigs in the background.

The varying size, shape and type of welds require a different degree of current and pressure for practically each of the parts. For this reason, each upper electrode can be independently controlled as to pressure, current and time. All electrodes contact the work simultaneously before the electronically controlled firing sequence is initiated.

Versatility of the machine is exemplified by the fact that each of the upper electrodes can be positioned at will to accommodate other types of record changer panels. The welding control can be set to any sequence desired by means of a telephone-jack type control board, shown at left in Fig. 1.

An electronically controlled means of delivering direct current impulses to the welding electrodes results in a perfectly balanced load on all three phases of the supply line. The company states that operating is at near unity power factor and on 75 per cent less line current; in other words, it is possible to install a multiple spotwelding unit such as this with no extra power distribution facilities needed, there being assurance of no line flicker.

New Self-Supporting Cable Shown in Spokane Exhibit

Detailed use of self-supporting Amerprene aerial cables, Amerductor and PFT armor rods, dead ends and splices were featured by the United States Steel Corp. subsidiaries at the exhibit sponsored by the National Rural Electric Association and held in Spokane, Wash., April 22 to 25.

The aerial cable, designed by American Steel & Wire Co., is intended to maintain continuity of service in heavily wooded areas and to eliminate cost of constant tree trimming.

Cable consists of a strong messenger cable plus three heavily insulated copper conductors finished with a conducting rubber sheath said to be as tough as tire-tread rubber. The demonstration stand enabled visitors to experiment with the new armor rods and multiple tie wires designed to protect Amerductor by damping vibration, improving fatigue characteristics and avoiding conductor chafing, burns, pitting and arc-over.

Standardization Course Offered at Columbia

Postgraduate course on industrial standardization is being offered by Columbia University, New York, in its department of industrial engineering and management. Fourteen lectures will compose the series, which is scheduled this spring.

Dr. John Gaillard, mechanical engineer of the American Standards Association is to give all the lectures. According to the ASA, this is the first course of its type offered by an American university.

Report on Welded Steel Merchant Vessels Offered

The Design and Methods of Construction of Welded Steel Merchant Vessels; Report of an Investigation is the title of a 164-page book compiled by a board set up by the Secretary of the Navy. The body of the report covers the entire 3-year period of the investigation, and contains many pages of information on such subjects as the following: Historical study of hull fractures, design, materials, construction, operating conditions, specific investigations; and international exchange of information.

Findings, conclusions, opinions and recommendations of the board are included in the book. Of especial interest is a section on a survey of shipyard welding practices.

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J. L. MORNING
Metallurgist
Bureau of Mines
Redding, Calif.

Adapts Pilot Plant to MANUFACTURE OF Alloy Steel

Low cost power generated at Shasta Dam, Calif., is utilized to test recently developed techniques for economical production of special alloy steels utilizing iron, chromium, manganese and nickel ores found on the West Coast

DURING recent years the Bureau of Mines, Washington, has done extensive work on development of new metallurgical processes particularly on the more effective use of low-grade domestic ores. This program[1] has included work on the direct reduction of iron ores to sponge iron, the smelting of nickel-bearing iron ores to produce ferronickel, and the production of pure manganese, chromium, and cobalt from low-grade ores by electrolytic processes.

A congressional appropriation for the investigation of raw material resources for steel production authorized the setting up of pilot plant work in three areas of the United States to demonstrate what could be done in applying certain of these new technologies in the development of processes particularly suited for effectively utilizing the available resources of the area in production of high-quality steels and other ferrous alloys.

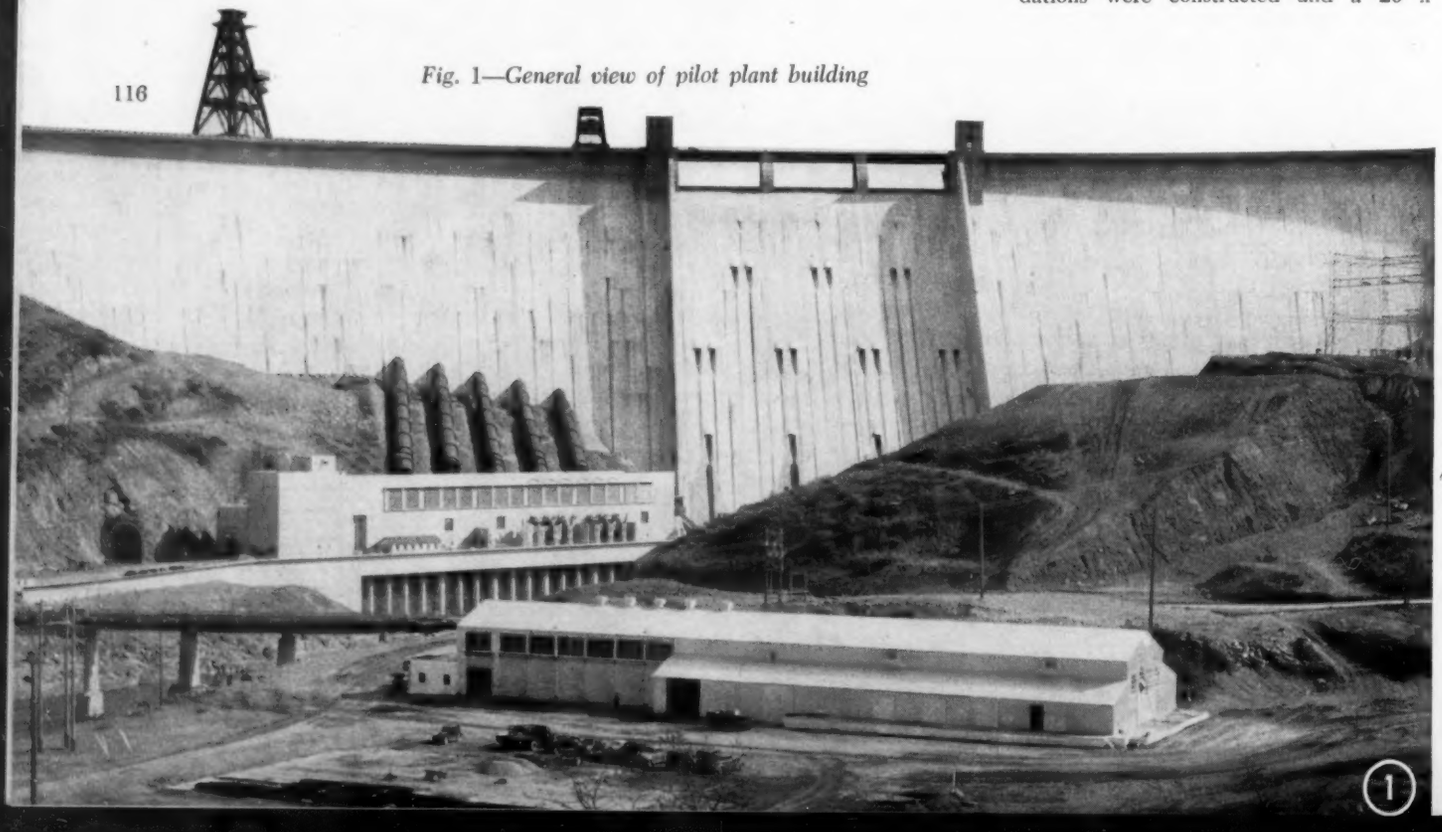
One of the areas chosen for this work was the central valley region of California. The availability of low-cost electric power at Shasta dam enhances the possibility of proving that some of these recently developed techniques can be combined to utilize the iron, chrome, manganese and nickel ores of this region in the economical production of special alloy steels which will find use in West Coast industries.

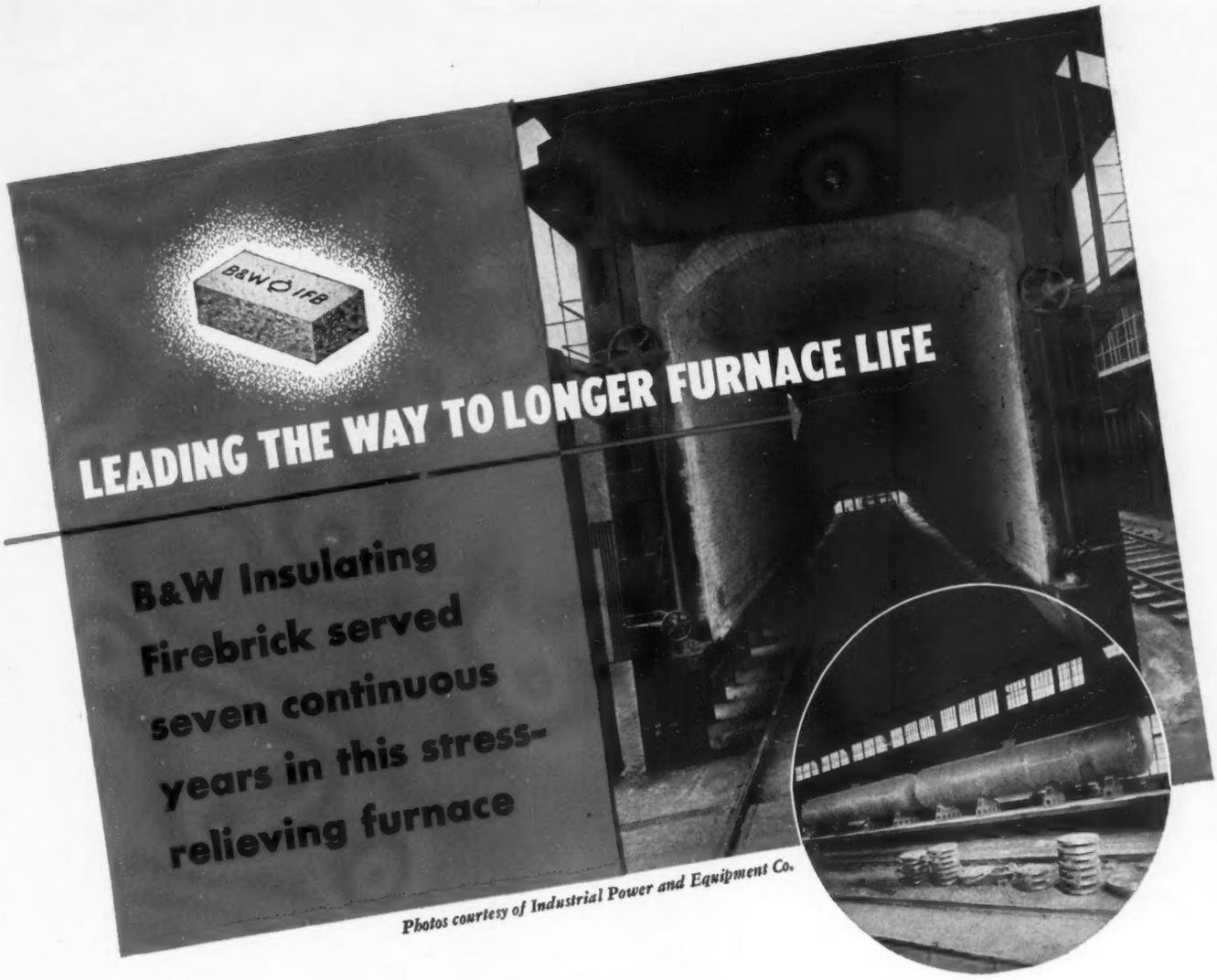
Pilot-plant facilities were already in operation at various Bureau of Mines stations for direct reduction of iron ores and production of pure metals by electrolytic processes. Accordingly, the preliminary treatment of the ores is carried out with these existing facilities. The installation at Shasta consists of an ingot-producing electric-furnace plant for production of steels and ferrous alloys on a semicommercial scale, using sponge iron and pure ferroalloy metals.

A building shown in Fig. 1, formerly used as a garage by Pacific Constructors Inc., was purchased by the Bureau of Reclamation and leased to the Bureau of Mines for housing the plant. The building is of steel and corrugated-iron construction and is directly across the Sacramento river from the power house at Shasta dam. The portion of the building made available for the pilot-plant installation consists of a 40 x 142 ft main bay with a 20 x 142 ft leanto bay running the full length of one side and a smaller leanto bay forming a 16 x 40 ft L on the opposite side of the main bay, as shown on the floor plan, Fig. 3.

In order to make the building suitable for use as a pilot plant, considerable alteration and construction work was required, and a contract was let for this work in June 1945. Crane runway beams were replaced with heavier members and the supporting columns were reinforced to permit installing 10-ton capacity overhead crane. Grease and oil pits were filled with the exception of one 9 x 45-ft pit which was bulkheaded and left open for use as a pouring pit. Furnace foundations were constructed and a 20 x

Fig. 1—General view of pilot plant building

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LEADING THE WAY TO LONGER FURNACE LIFE
B&W Insulating Firebrick served seven continuous years in this stress-relieving furnace

Photos courtesy of Industrial Power and Equipment Co.

Details of Rebuilt Furnace

Length — 95 feet 4½ inches
Width — 13 feet
Height — 17 feet 7½ inches

Sidewalls and end — 9" B&W K-23 I.F.B. Backed with 4½" B&W K-20 I.F.B. Door and arches—9" B&W K-23 I.F.B. Car top —4½" heavy firebrick, 2½ inches B&W K-20 I.F.B., 2" B&W K-20 Concrete Mix. All B&W I.F.B. laid up in B&W Smooth-set Mortar.

In 1939 this large stress-relieving furnace was built by the Industrial Power and Equipment Company for the Milton, Pa. plant of the American Car and Foundry Company. Side walls, end wall, arch and door were constructed of B&W Insulating Firebrick. The car was protected by layers of B&W Insulating Concrete and B&W Insulating Firebrick, topped off with a layer of firebrick.

For seven years, these refractories stood up under continuous, severe service.

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27-ft transformer vault was built of reinforced concrete. A one-story 60 x 25-ft addition of concrete construction, was built to house the offices, analytical laboratory, and change room.

Plant Equipment: It was decided that, for the purpose of this investigation, a direct-arc furnace with a maximum capacity of approximately 4 tons would be most suitable. A furnace of this capacity is large enough to allow accurate control of furnace conditions so that melting procedures developed may be readily adapted to larger furnaces. Furthermore, a sufficient number of commercial-size ingots can be poured from each heat to enable comparative fabrication tests to be made in various industrial forging plants and rolling mills on a full commercial scale.

The furnace, Fig. 2, is a 2 R, 3-phase direct-arc Heroult furnace with inside shell diameter of 8 ft. Overall height of the shell is 6 ft and height to the foreplate is 3 ft. Graphite electrodes 8-in. diameter are spaced on a 27-in. diameter electrode circle. The roof is removed for charging by a gantry crane mechanism with motor-operated roof lift and gantry travel.

The single, counterweighted working door is motor-operated and is located opposite the tap hole. The door and door frame are water-cooled and of the Blaw-Knox type of construction. Roof rings are constructed with a water-cooled skewback. The furnace is tilted forward 40 degrees for tapping and backward 12 degrees for slagging off by a motor-driven, crank-operated tilt mechanism.

Electrode holders are of the water-cooled wedge type, and copper over the furnace is in the form of a single water-cooled copper bus tube in each phase. The furnace is installed at ground level with tapping and slag pits as shown in Fig. 3. A structural steel platform is attached to the furnace at the floor line and tilts with the furnace. The furnace is basic-lined with a rammed magnesite bottom and 9-in. sidewalls of steel encased magnesite brick. A 9-in. silica roof was originally installed, but intermittent operation of the furnace has necessitated a change to superduty fire clay construction.

The pilot plant is served by a 13,800-v line direct from the power plant at Shasta dam. Power for furnace operation is brought into the transformer vault, to a magne-blast air circuit breaker, which is of the electrically-operated draw-out type and is rated at 15,000 v, 600 amp, with a rupturing capacity of 250,000 kva. The circuit breaker is mounted in a metal-clad switchgear cubicle which also contains the tripping current transformers and surge protective capacitors. Lighting and auxiliary power is obtained from a transformer bank with a rated capacity of 195 kva located outside the building. Single-phase 110 and 220-v and 3-phase 220-v power is supplied throughout the plant. Direct current at 250 v for furnace control circuits is fur-

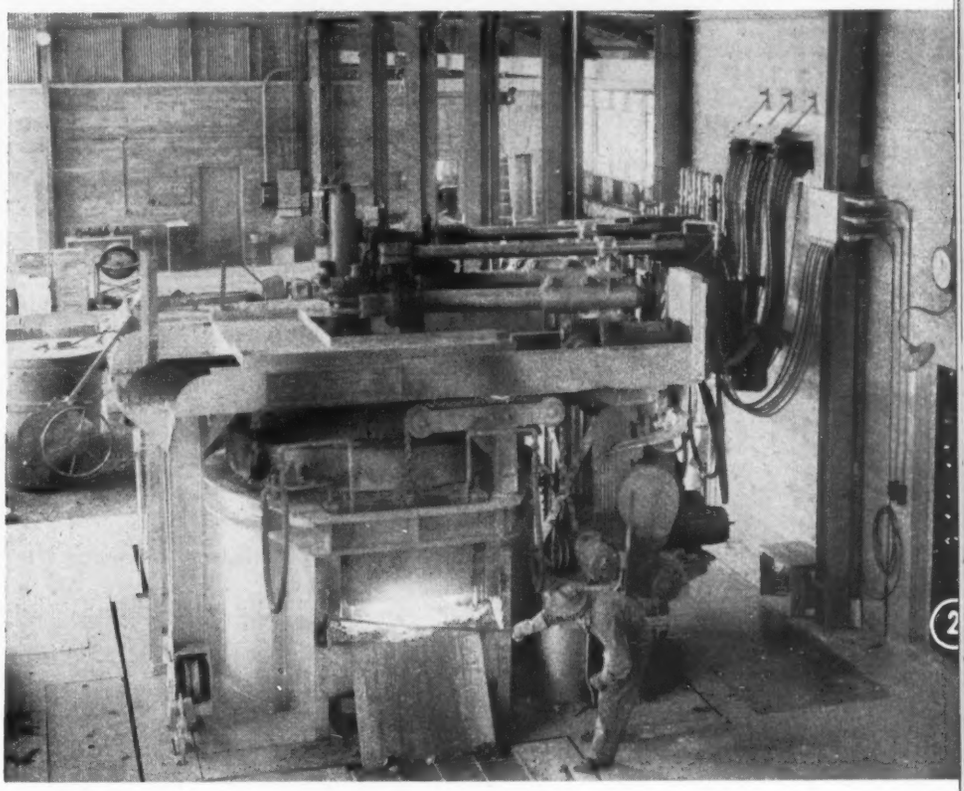
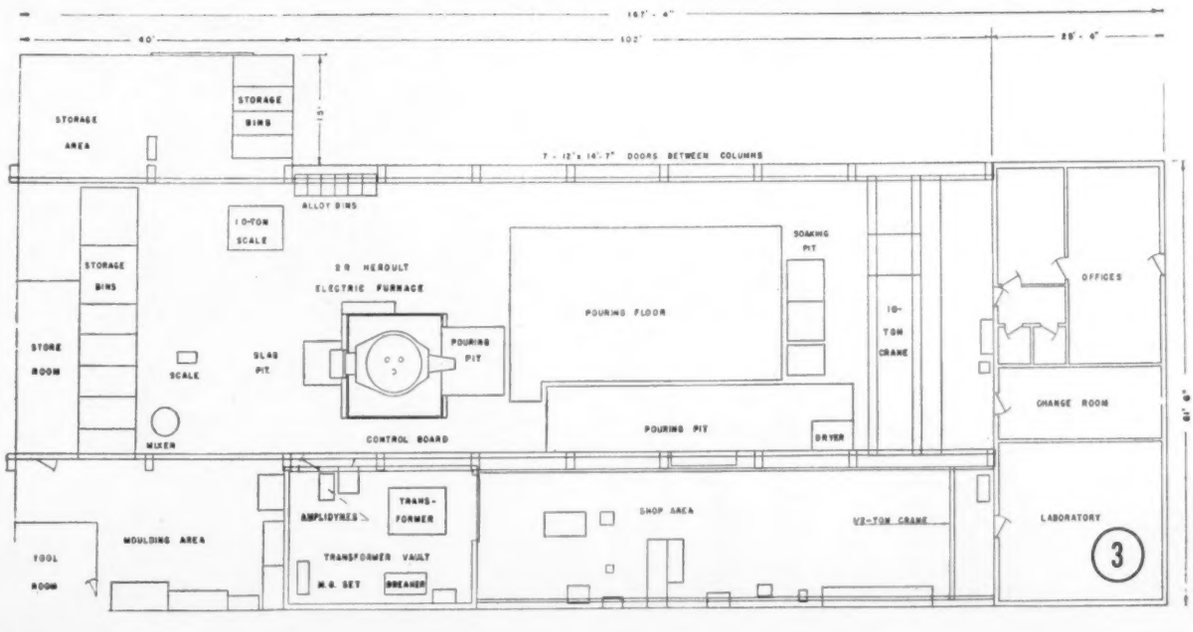


Fig. 2—Interior view of pilot plant with 4-ton electric arc furnaces in foreground

Fig. 3—Floor plan of alloy steel pilot plant



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DISTRIBUTORS handling products of Boston Woven Hose & Rubber Co., Boston, are learning first hand how rubber mechanical goods are manufactured and how they are applied industrially.

In a concentrated course lasting 5 days, the company endeavors to bring classes of 12 to 14 men up to date with the latest production techniques and sales policies. Typical class is shown in the accompanying photograph.

Engineered by H. F. Maxon, vice president and sales manager, the course takes students through classroom and practical work calculated to give a sound knowledge of what is going on in the business.

Curriculum includes lectures on synthetic rubber hose construction, plastics, belting, wrapped hose, molded hose, V-belts, friction tape, packing, tubing, matting, nozzles and the like, advertising and sales approaches.

Classroom work is supplemented with visits to the plant, giving each student an opportunity to watch the processes, thus simplifying highly technical points by on-the-spot observations. Questions and answers flow freely in both classroom and plant. Operating and sales personnel constitute the teaching staff.

Visiting salesmen pay their own traveling expenses, but once they arrive in Boston, they immediately become guests of the company. Extra-curricular activities include entertainment planned by R. E. Conder, sales promotion and advertising manager.

nished by a 7½-kw motor generator set in the transformer vault.

The furnace transformer is rated at 2000 kva and is water cooled and oil insulated. The transformer is provided with 6-point motor-operated ratio adjusters and delta-wye switch connected in the high-voltage winding to give no load secondary voltages of 220, 205, 190, 175, 160, 145, 130, 115 and 100 v—all at full capacity with the primary connected delta and the corresponding wye voltages at reduced capacity. In addition, the transformer is so designed that the secondary coils may be connected in multiple instead of series to give secondary voltages varying from 29 to 110 v if such lower voltages should be required in the course of future experimental work. Ratio adjuster positions are changed by a momentary contact switch mounted on the control panel to give a choice of six different operating voltages at the option of the operator. A tapped reactor having a total reactance of 26.17 per cent is mounted inside the transformer tank and so arranged that reactor taps are changed with the transformer taps through operation of the motor-driven ratio adjusters to provide circuit stabilization at the higher voltages.

Secondary transformer leads are brought out interlaced to the transformer vault wall where connections to the furnace bus are made with air-cooled, bare, flexible leads consisting of 10 one-million-circular-mil cables in each phase. Furnace control is of the rotating type, using three amplidyne motor generators to drive the 3-hp, 230-v, direct current electrode winch motors. The control panel is of standard design for this type of installation, with the exception that a 6-position tap-changer switch is provided instead of the usual 4 or 5-position type. A voltmeter with transfer switch, three ammeters, indicating wattmeter, and watt-hour meter are provided on the control panel. A graphic wattmeter operating from the primary circuit has been installed in the transformer vault.

Auxiliary Equipment: The 40 x 142-ft main bay area of the plant is served by a cab-operated, overhead traveling crane of 10-ton capacity. Molten metal from the furnace is tapped into one of two firebrick lined, bottom-pour ladles of standard design. These ladles each have a capacity of approximately 11,000 lb of molten steel. Ladles are dried and preheated first with a 30-kw electric heater, which was constructed in the plant shop. About 30 min before tapping into the ladle, the electric heater is removed, and the ladle lining is brought to a dull-red heat with a portable oil burner. Stopper rods are dried for several days before use in an electrically-heated drying oven.

Ingot molds of various sizes are available for casting ingots ranging from 30 to 1700 lb each. All molds are of the big-end-up type, and most sizes are provided with refractory hot tops. The majority of ingots produced are of a size suitable for reduction to finished products in nearby industrial rolling and forging plants.

Bath temperatures in the furnace are checked with a Rustless Iron & Steel type, quick-immersion thermocouple assembly connected to a recording electronic potentiometer. When not in use with the quick-immersion thermocouple, the potentiometer is connected through a transfer switch to a platinum-platinum rhodium thermocouple installed in the furnace roof to give a continuous indication of roof temperature.

All furnace charges and additions are accurately weighted on either a platform scale with a capacity of 10 tons, or a portable dial scale with a capacity of 200 lb, located adjacent to the furnace. Storage bins for raw materials, alloys and fluxes are provided as shown in Fig. 2.

A direct oil-fired soaking pit was constructed for slow-cooling, high-alloy ingots. The pit is rectangular in cross section, with inside dimensions of 9 ft x 3 ft 1 in. x 3 ft 8 in. deep. The insulated cover is constructed in two sections to facilitate handling.

Molding facilities are provided to allow pouring small castings for test purposes and plant use. A blacksmith and welding shop, an electric test bench, and a small machine shop equipped

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with a lathe, drill press, power hack saw, and grinder are available for maintenance and construction of plant equipment.

Plant Operation: Because the work is experimental, the furnace is operated on an intermittent schedule, which imposes some problems not usually encountered in operating a furnace of this size. Silica brick spalls considerably on frequent cooling below red heat, and it was necessary to use superduty fireclay brick for roof construction to increase roof life. This type of brick has been found to be suitable for this application.

Hot patching of the furnace banks and bottom with dolomite or magnesite was found to be impractical, since even a small amount of basic slag remaining under the patch material would powder up on cooling and loosen the patch. If the furnace is not to be used for several days it is allowed to cool without patching after tapping the heat. When cool, any powdered slag remaining in the furnace is cleaned out, and magnesite ramming material is used for patching. If the furnace is to be charged again in a reasonable time after tapping, the usual hot-patching procedure is followed.

Ingot molds generally have ample time to cool to room temperature before re-use. It was therefore necessary to devise some method of drying the molds and heating them to a suitable temperature before each pour. Since natural gas is not available at the plant site, small individual electric mold heaters varying from 500 to 1500 watts each, depending on the mold size, were constructed and proved to be the most suitable and convenient method for heating the molds. The heaters consist of resistance wire coils wound on a core of transite board ½-in. thick, 2½-in. wide and varying in length with the depth of the mold. The heater is suspended from a square piece of transite, which acts as a cover for the mold when the heater is in place. Use of the heaters results in uniform and readily controlled heating of the molds. They are easily disconnected and removed from the molds a few minutes before pouring.

Analytical laboratory is equipped for running rapid control analyses, as well as complete determinations on raw materials, refractories, and finished products. A carbanalyzer is available for rapid carbon estimation on plain-carbon and low-alloy heats.

Operating personnel originally consisted of five technical employees, one clerk typist, and eight skilled mechanics, operators and laborers. Due to a curtailment of funds for plant operation in July 1946, it was necessary to reduce the operating and maintenance crew to four, making a total of ten employees.

The plant has been in operation since March 1946. Initial work was undertaken on production of steels and iron-manganese alloys using sponge iron produced from California magnetite ore at the Bureau of Mines sponge iron pilot plant, Laramie, Wyo. by a rotary-kiln process.[2]

Alloy ingots produced in the pilot plant are shipped to West Coast industrial plants, where they are fabricated into finished products to determine rolling and forging characteristics on a commercial scale and provide material for further investigation of physical and mechanical properties and full-scale, commercial-use tests.

Acknowledgement is due C. W. Davis, chief, Boulder City division, Metallurgical branch; R. G. Knickerbocker, formerly chief, Metallurgical Branch; and R. S. Dean, formerly assistant director, under whose supervision the pilot plant design and construction work was carried out.

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REFERENCES

(1) Dean, R. S., The Metallurgical Research Program of the Bureau of Mines Relating to Iron and Steel: Bureau of Mines Report of Investigations 3920, 1946, 17 pp.

(2) Johnston, T. L., Producing Sponge Iron in a Rotary Kiln: STEEL, vol. 117, Nov. 12, 1945, pp. 128-129, 140, 142.

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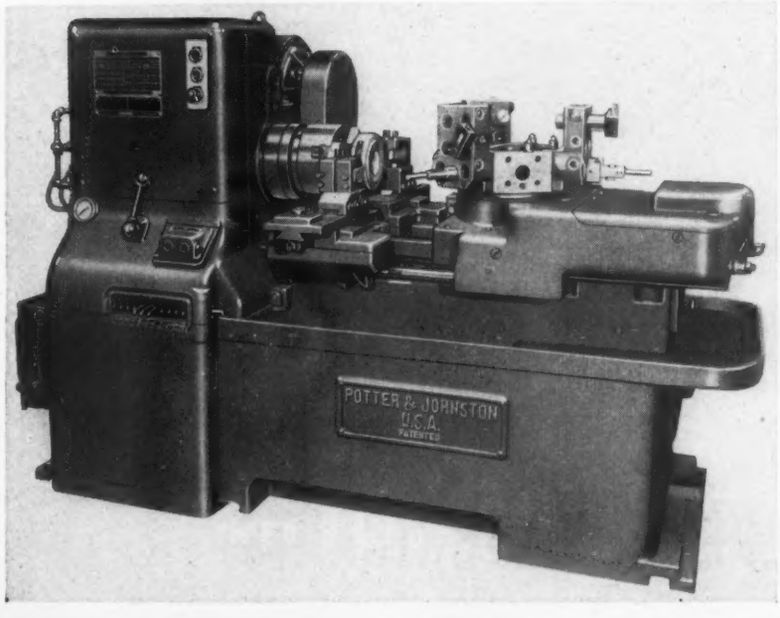

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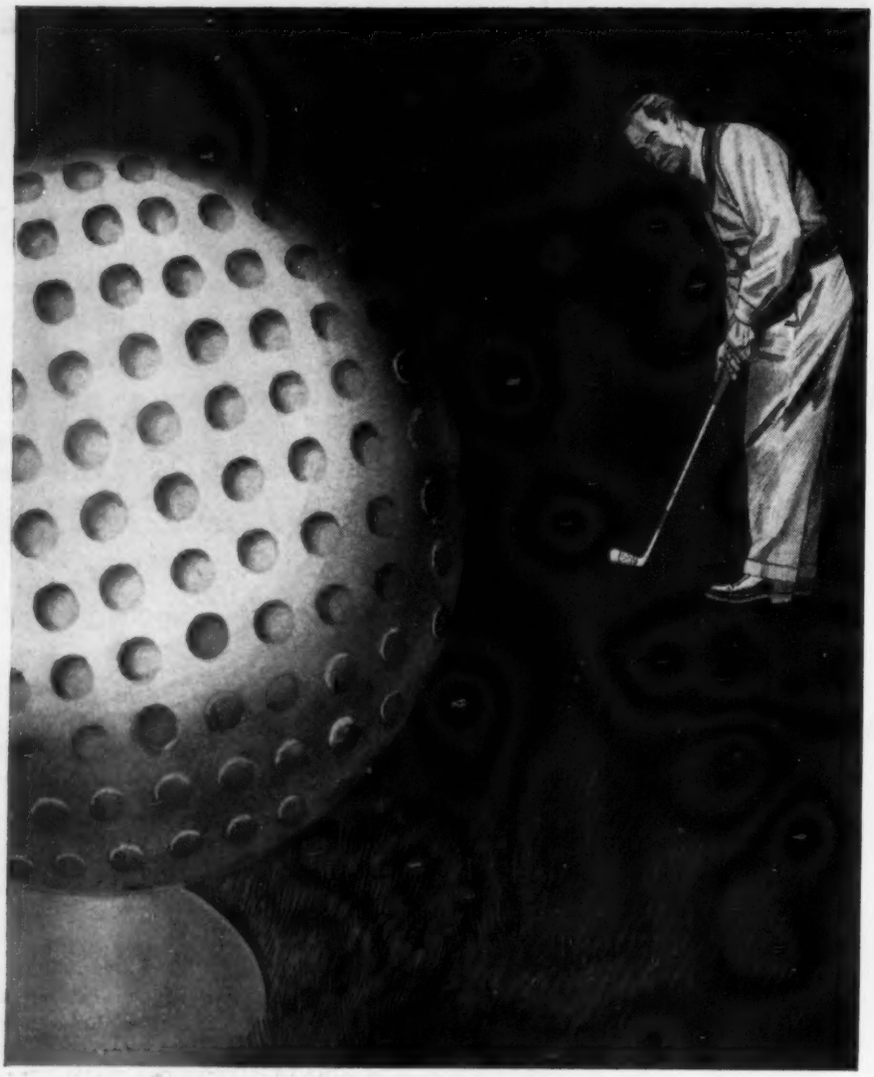

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Steel Truck Bodies

(*Continued from Page* 99)

wood beams with a steel capping angle or channel, however, have certain advantages. When a wood longitudinal sill is used, steel cross sills should not be allowed to bear directly on the wood as they will sink in a bit when the truck is heavily loaded. When unloaded, the cross sill may reflect back to its normal position, leaving it out of contact with the longitudinal sill.

Further, completely seasoned wood is essential for the longitudinal sills in order to reduce to a minimum shrinking or warping. If shrinkage and warpage occur, some cross sills may be out of contact, some in closer than normal contact, some may have to bend or twist to make contact as the truck is loaded. It is therefore preferred practice to use a steel bearing capping angle or channel. Such steel caps float the load to be transferred from the cross sill to the longitudinal sill over a multiplied area. This type construction is a future trouble saver and also prolongs the life of the truck body.

Major Body Dimensions

There are three major dimensions for any truck body: Length, width and height. Through the Parish type of construction required dimensions can be met using standard mass produced members. The different load capacities are secured by different spacing of cross sills also of standard construction.

Given the dimensional requirements for a truck body, the body manufacturer refers to his chart of dimensions of the various members. Inasmuch as the members have a series of holes drilled in the web spaced on multiples of 1 in. (usually they are on 2 in. centers) the body builder can quickly determine the proper length for the particular body and cut the member just ahead of the proper hole.

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Bridgeport Adds New Large Plant at Indianapolis

Purchase of the Indianapolis brass mill which the company built and operated for the United States Government, marks a major step in Bridgeport's program of service to the metal fabricating industry on a nation-wide basis. The Indianapolis plant was built in 1941 and was operated by the Bridgeport Brass Company from 1942 to the end of the war. It established an outstanding record for the production of cartridge brass and cartridge cases.

The ninety-acre property contains a group of fine, modern buildings which comprise more than 817,000 square feet of floor space. These include the casting shop, rolling mill and rod mill as well as complete laboratory facilities.

Casting Shop

The all-electric casting shop contains the most modern of the larger type induction furnaces in existence for melting brass. In addition, there are two continuous casting machines, which bring the pouring capacity of the Indianapolis plant to impressive proportions.

Rolling Mill

The Indianapolis plant was designed to make heavy-gauge brass strip. Additional machines and equipment are being installed as rapidly as possible for the straight-line production of strip in the lighter gauges. All material is processed on a straight-line production basis with a minimum of delay and waste motion as it passes from unit to unit.

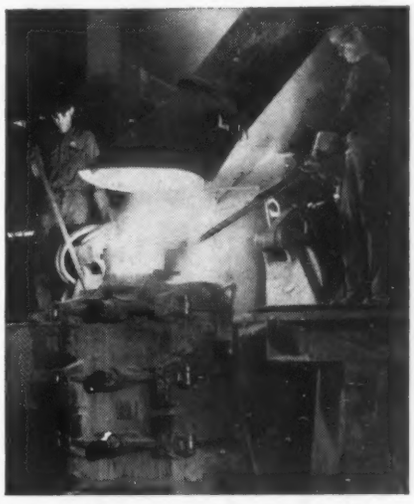
Rod and Tube Mill

A powerful modern extrusion press is employed for converting red-hot billets into rod. This press, which is rated at 3850 tons, handles billets up to 10 inches in diameter and about 22 inches long. Other equipment in the rod mill consists of modern draw benches, re-heating and annealing furnaces, conveyors and other handling machinery. Brass rod in a variety of sizes can now be produced.

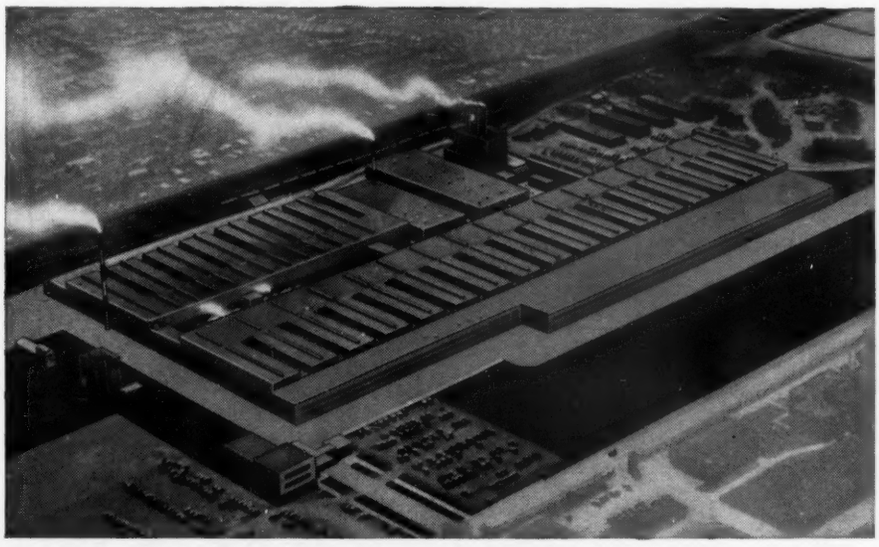
Plans are under way for making copper water tubing for plumbing and heating applications as well as miscellaneous tubing for fabrication.

Laboratory

There are complete laboratory facilities at Indianapolis for the quality control of all mill products and to aid customers with fabrication problems. Bridgeport's research, metallurgical skill, production experience and technical service will be incorporated in the products of this new mill.



Indianapolis has modern electric melting furnaces of the latest type and greatest capacity.

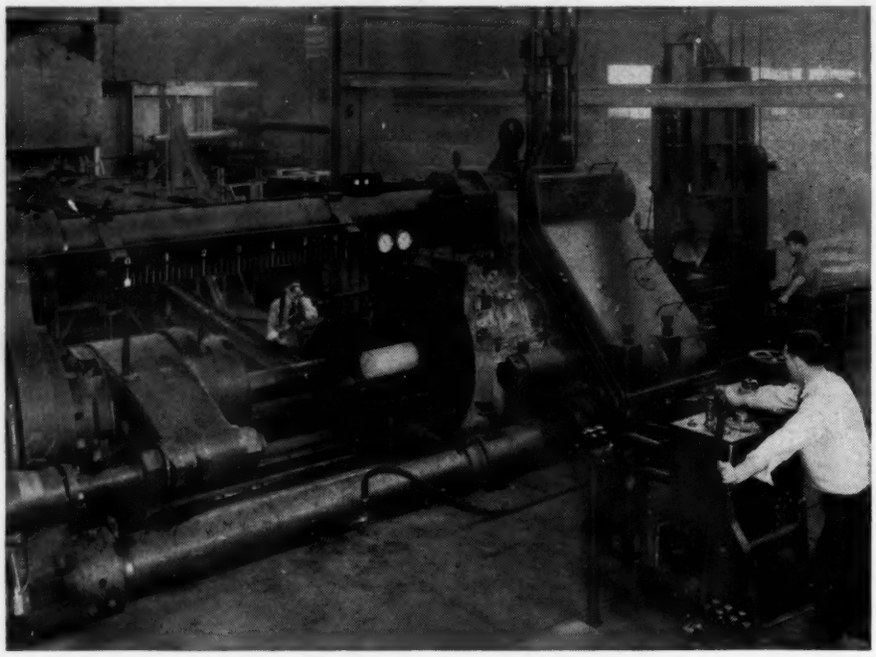


Bridgeport's Indianapolis plant has a floor space of 817,000 square feet and is located on a 90-acre plot.

Centrally Located

The Indianapolis plant is strategi-

cally located to serve one of the fastest-growing, metal-working territories in the country. Considering Indianapolis as the hub, a circle with a radius of five hundred miles will take in the most important cities in the great industrial empire of the Midwest. Here are located such manufacturing centers as Detroit, Chicago, Cleveland, St. Louis, Cincinnati, Toledo, Columbus, Louisville, Milwaukee, Kansas City, Memphis and Pittsburgh. Mill shipments leaving Indianapolis by truck can be delivered overnight to most of these. Rail deliveries to Texas, Oklahoma, Colorado, California, Oregon and Washington will save many days when deliveries are made from Indianapolis rather than from Bridgeport, Connecticut.



3850-ton extrusion press converts red-hot billets into rod.

When this mill reaches full capacity, manufacturers in the Midwest, North and Southwest and Pacific Coast areas will be benefited in a very substantial way. Of course, as the capacity of our Indianapolis plant increases, more and more of the production at Bridgeport, Connecticut, will serve the manufacturers in the East.

The new plant will bring to the doorstep of thousands of manufacturers specialized skills and technical knowledge of men long familiar with all phases of brass-making as well as the application of copper-base alloys in a wide variety of products. With improved facilities and greater resources we look forward to giving increased and better service to our customers throughout the land.

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8. Flare bottom post bases which reinforce the post at the points of most critical stresses without the need of a reinforcement piece.

9. Protection of plywood lining by a specially designed base rail. A center belt line also protects plywood lining and provides tie holes.

10. Roof moldings formed integral with the roof caps. No applied moldings are required at the top. This new detail insures a tight fit of the roof assembly to the upper panel sheet. Roof is easily removable for repairs without molding tear downs and replacements.

Increases in Production

According to White Motor Co. engineers, under today's conditions, with body shops running at full capacity and production space at a premium, use of the type B sections and modern assembly methods permits even further increases in production. No space-consuming, nonflexible assembly jigs are required to attain production speed in the assembly of the basic structure. Full assembly of a wide range of body types can be accomplished by clip fastener methods on an assembly dolly. This dolly is an integral part of the moving production line, and utilizes no productive floor space than a normal body under construction.

Main essential details of the B-line body structure are shown in Fig. 1. This general cross section of a typical body frame illustrates the ten features outlined above.

Holes which appear in large numbers in each section are used as temporary assembly or locator points through which temporary assemblies are made by means of universal spring clamps. Each piece in the assembly is first cut to size by cutting just ahead of the hole which controls the desired dimension on the assembly. Then the temporary assembly is made by means of the universal spring

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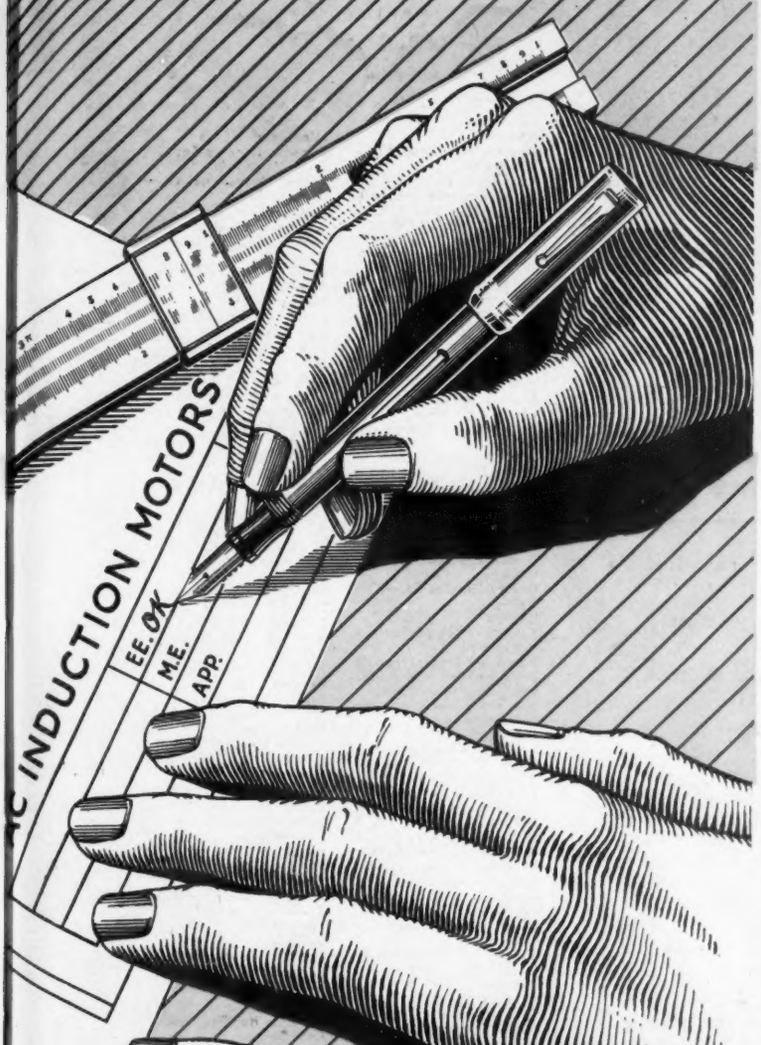

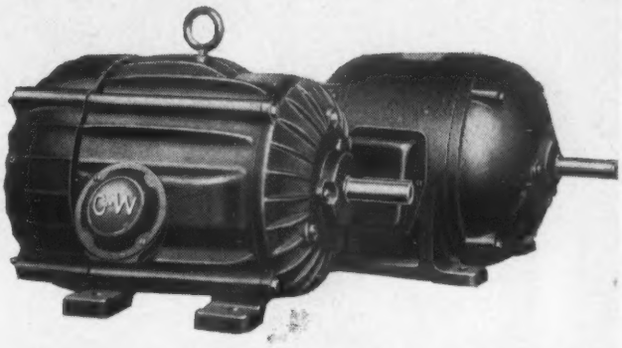

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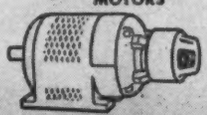
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clamps which operate in the assembly holes and are very rapid and positive in action. They quickly secure the component parts in position for welding the various structural points. After the arc welding is completed, the universal spring clamps are removed from the assembly. They are then available for use over and over again on other jobs.

Complete roof subassemblies, side and end subassemblies and door frames may be assembled with universal spring clamps and then arc welded together as unit subassemblies. Then they may be attached to the main job by means of bolts or rivets or welds as desired.

In building up the roof, the entire assembly is first made as a unit down on a table or benches at an easy working height. It is then placed on the finished body like the lid on a kettle. To pull the roof down tightly into position 5/16-in. bolts are used through the holes in the horizontal plane of the No. 17 lintel and the shoe of the No. 10 carline segment. Then the bottom row of holes in the No. 16 roof cap are drilled through the top panel and through the outside vertical leg of the No. 17 lintel. The lower edge of the No. 16 roof cap is then drawn on tightly against the top panel and bolted or riveted through this panel to the No. 17 lintel. No finish molding is required at this assembly.

Adjustable Fixture Used

To make side, end and door frame assemblies, an adjustable fixture applicable to all these flat assemblies can be made simply by drilling a large section of 14-gage plate with 7/32-in. diameter holes spaced both vertically and horizontally on 2-in. centers. A large fixture of this nature can be built up from several 14-gage plates which have been previously stiffened by welding ribs on the back surfaces. The idea of this fixture is to obtain a large field of holes on 2-in. centers, both horizontally and vertically.

Holes in the body sections also are perforated on the even multiple of 2 in. and will therefore synchronize themselves with the hole locations in the fixture plate. To locate units of the assembly on the fixture plate, two or more pins should be set in the proper holes in the plate. After part is located in place over these guide pins, it can be held securely in position by inserting the universal spring clamps into other holes in the same line defined by the guide or locator pins.

Above plate fixture method is very good where several subassembly details all of the same size must be made. When only one single or possibly two units of the same kind are involved, however, it may be faster to make a direct assembly of the parts with the

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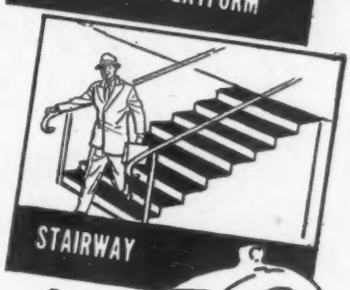

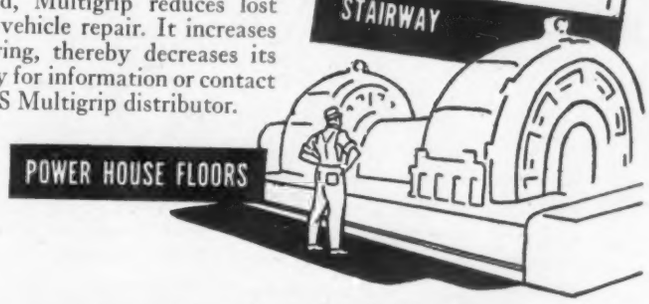

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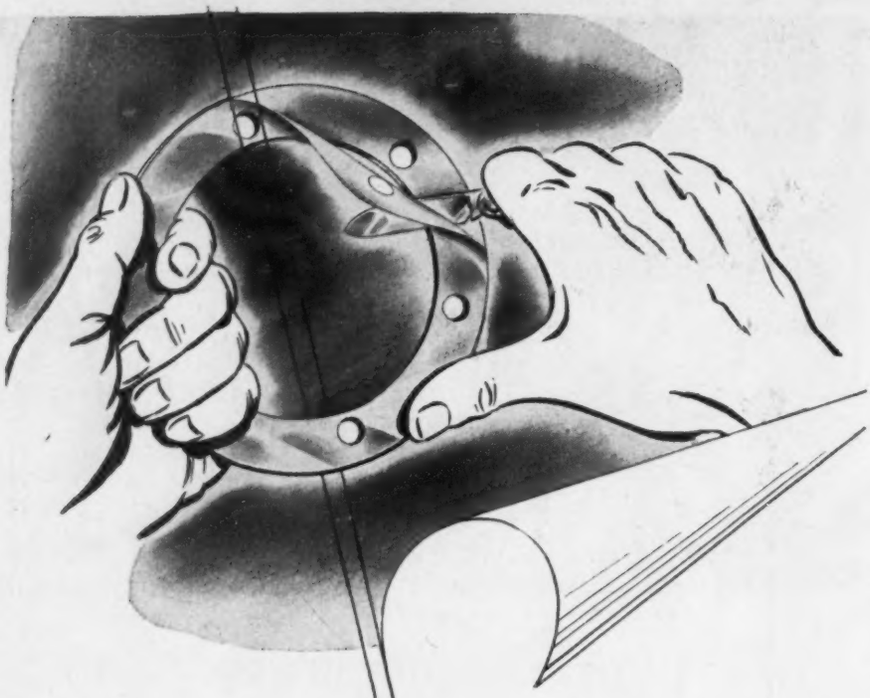

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universal spring clamps without taking the time to set up the locator pins in the fixture plate. A little experience with both of these methods will soon give the body builder sufficient experience to determine which method is best for the job at hand.

Note that the height, width and panel dimensions are all held in fixed increments of 2 in. Other odd dimensions may be obtained, but to do this one group of holes at the end of the height, width or length dimension involved will be out of matching alignment, and the end joint will have to be held in clamps for welding unless special odd holes are drilled at these ends previous to the assembly.

Outside panel sheets, including roof panels, are all plain rectangular sheets cut only to length and width dimensions. No other forming of these panels is required. All holes for riveting panels in place are prefabricated in the frame structural members. Assembly of outside panels consists of cutting them to rectangular size, laying them against the frame structure and drilling holes in the thin panel metal, using the holes already in the frame structure as drilling guides. The holes are drilled only at the points where rivets are to be applied.

Before panels are applied all joints should have an application of a good metallic sealing compound such as Alumilastic. It is imperative that this detail be observed in the roof panel application.

If desired, panels may be assembled in the body structure by spot welding. The structure is designed so all panel points are easily accessible to regular spot welding equipment. Spot welds have been successfully made through the Alumilastic sealing compound.

Great advantage in the door construction lies in its unit assembly possibilities. Entire door assembly, including the outside frame in which it sits, can be built up as a subassembly complete with all necessary sheet metal panels, plywood lining, hinges, hardware, locks etc. The work can all be done down on a bench where the parts are more accessible and the work is more rapid than assembling the door piece by piece up in the body sidewall.

Fig. 8 shows typical connection details at the 6-in. radius front and rear corners and at the square rear end corner assemblies. The 6-in. radius corner construction is started by first mounting the No. 76 corner bracket to the ends of the front or rear end cross sills. After the No. 76 bracket is in place, a No. 15 end post is erected at each vertical edge of the No. 76 bracket.

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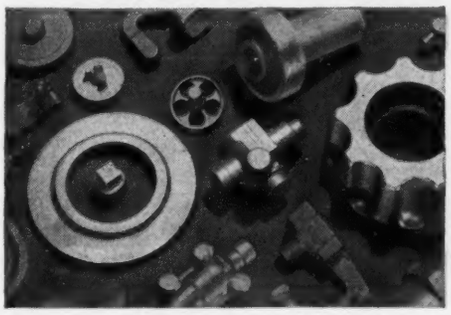

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post inside of the upset formed in the No. 76 corner bracket. Sometimes this No. 15 end post will be a component part of a complete side or end assembly which previously was welded together as a subassembly unit. In this case, the No. 76 corner bracket is added at the time the side or front end assemblies are erected in the structure.

Notice in the layouts that proper cut off edge distances beyond the centers of the last holes in the No. 17 lintels are given. Actual overall lengths of these parts can be determined from the fixed dimensions shown after the "W" or width and the "L" or length dimensions are established.

Mounting Steel Cross Sill

Load-carrying efficiency of a steel cross sill mounted over a chassis frame is determined to a great extent by the methods used in its mounting. Steel cross sills are essentially channel sections which, when mounted and extended over a chassis frame, function as cantilever beams. Under this type of loading the top flange of the cross sill is in tension while the bottom flange is in compression and has a tendency, due to this compressive force, to buckle.

Greatest external load applied to this cross sill will always occur at the reaction points or the points where the cross sill bears on the longitudinal sill or the chassis frame. Sills which are not properly reinforced against buckling action lose as much as 50 per cent of their load-carrying efficiency.

Buckling reinforcement is provided by two-way gusset combination which works in conjunction with a bearing channel capping the wood longitudinal sill. The lower or triangular buckling reinforcing portion of this gusset actually gets underneath the bottom flange.

When this portion of the gusset is welded to the bottom flange of the cross sill, the result is a T-section which prevents any buckling. This gusset has the additional advantage of spreading the effect of the reactionary forces out along the sill for several inches toward the end or the direction from which the acting load forces originate. The high back portion of this gusset reaches up on the web of the cross sill and becomes a very effective tortional brace.

The welded assembly of the cross sill, the bearing channel and this combination gusset gives a box corner effect which is stiffest at the point of greatest reaction stress and which gradually becomes more flexible and yielding as the reactionary forces are dissipated farther out in a wider spread area. Therefore, this combination has more cushioning or shock-absorbing ability than other buckling reinforcement methods. This con-

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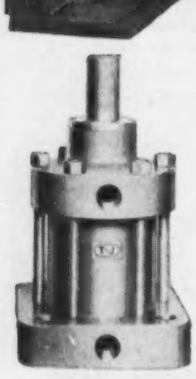
In these air-operated press welders manufactured by The Taylor-Winfield Corp., Warren, Ohio, T-J Cylinders contribute to the rapid and efficient operation of the machines. The cylinder is employed to move the welding head to the work and return—a job performed by T-J with *accuracy, speed* and *dependability!*



This is typical of the widespread use of T-J Cylinders today to simplify operations and save time and labor. There's a T-J Air or Hydraulic Cylinder *exactly right* for all kinds of tough jobs where pushing, pulling or lifting is needed . . . 100 lb. or 50,000 lb. Available in many standard sizes and styles . . . both cushioned and non-cushioned types. Backed by 30 years of know-how . . . T-J engineered to do the job *better* and *cut costs!* Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.

TOMKINS-JOHNSON

RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

T-J

struction method was developed and patented by Parish Pressed Steel Co. working in close co-operation with several commercial body builders.

When a steel longitudinal sill is used in the place of wood, it is recommended that a wood spacer be used between this longitudinal sill and the chassis frame. This helps to cushion against shock.

Mounting giving the best cushioning effect is an all-wood longitudinal sill. This wood sill need not be over 2 in. wide. The No. 35 bearing channel cap is always recommended because a heavily loaded cross sill will sink into the wood bearing members. Later as the body is unloaded the cross sill can then reflect back into normal position which may leave the cross sill out of contact with the wood longitudinal sill.

Another difficulty experienced with wood longitudinals is that the wood may not be completely seasoned and may tend to shrink away from some of the cross sills while actually warping into closer contact with others thus causing certain cross sills to carry overloads while others have to twist or bend down to carry any load at all. To overcome this difficulty the body builder uses the No. 35 bearing channel to insure a more even spread of the load over changing surface conditions on the wood.

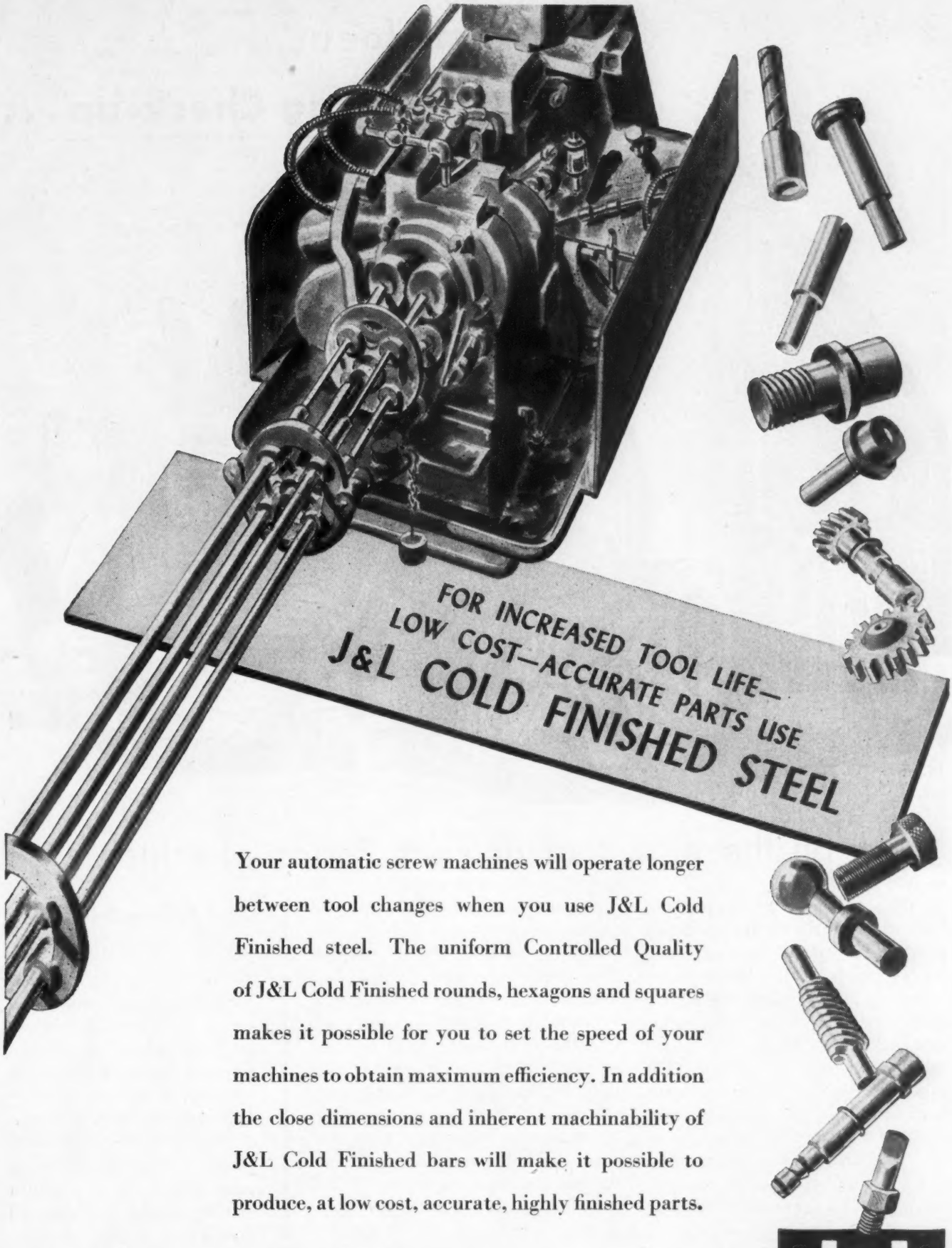
Lower Side Post Section

Isometric perspective view in Fig. 5 shows the general arrangement of the parts involved where the lower side post section connects to the end of the cross sill. The side post is a 2-piece design which permits the use of a very light gage steel at the top and a much heavier gage at the bottom. The post flanges taper from a minimum of ¾-in. at the top to a maximum of 1⅜-in. at the bottom.

These posts are designed so that the metal is placed in greater volumes where the greater stresses occur and so there is no surplus weight of metal where it is not required to carry loads. The final result gives a much lighter post as well as stronger and more efficient structure.

Flared-out base design is used in this post to overcome the difficulties experienced at one of the most critical weak spots encountered in all former types of body construction. The flared surface at the base provides a much greater spread between the weld fillets than can be obtained on a straight post. The narrower neck or critical stress zone of the post is no longer at the point where the post first intersects the cross sill but is now several inches above this point. In this manner, it is kept completely away from the heat zone where the welding is applied.

Down in the zone where heavy weld-



FOR INCREASED TOOL LIFE—
LOW COST—ACCURATE PARTS USE
J&L COLD FINISHED STEEL

Your automatic screw machines will operate longer between tool changes when you use J&L Cold Finished steel. The uniform Controlled Quality of J&L Cold Finished rounds, hexagons and squares makes it possible for you to set the speed of your machines to obtain maximum efficiency. In addition the close dimensions and inherent machinability of J&L Cold Finished bars will make it possible to produce, at low cost, accurate, highly finished parts.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

J&L STEEL

Time for a

Spring Check-up . . .

on the plan that delivers Peace of Mind

THANKS to the work of patriotic volunteers, the U. S. Savings Bonds program has carried America a long way up the road to economic security.

During 1946, in spite of all the problems and uncertainties the nation faced, sales of Savings Bonds *exceeded redemptions* by $1,389,216,000. The success of this great sales operation has helped stem the tide of inflation, has reduced public debt holdings of the banking system, and has given millions of citizens a stake in their country and a profitable investment in their own futures.

Yes, we've come a long way—but the trip isn't over! Now is the time to check up on your Payroll Savings Plan. Make sure that all your new employees are familiar with its advantages. Remind *all* your employees that there's no easier, surer way to build their own futures—and America's—than by buying Bonds regularly through the Payroll Savings Plan. Every $3 invested pays $4 at maturity!

For any help you need in conducting the Payroll Plan, call on your State Director of the Treasury Department's Savings Bonds Division.

New Savings Bonds Plan won't affect the P.S.P.

SOON the Treasury Department and the banks of America will make it possible for farmers, doctors, and other self-employed people to participate in "automatic" Bond buying by special arrangement with their banks. This extension of the Savings Bonds program is not a partial payment plan and is intended *only* for people who are not in a position to take advantage of the Payroll Savings Plan.

The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

ing of the post is required the effective depth of the post is from 30 to 70 per cent greater than it is throughout the remainder of the post section. Therefore, the stress per square inch of cross sectional area is considerably reduced. The actual physical strength lost in the metal to the welding heat is more than compensated for by this reduction in stress requirement made possible by flaring out the post base. The wider welding zone also increases the efficiency of the weld and thus means less required inches of weld fillet and less weld heat.

The post base design makes the structure especially well suited for open top bodies or any body where there is excessive side wall pressure or side sway. Not only has the post base been greatly increased in strength and efficiency but also considerable weight has been removed from the upper part of the post where it can no longer sway with the side and set up increased stresses at the base. This detail is accomplished with no loss of space where the surface of the side wall and the top of the floor intersect in a square corner. The addition of the No. 19 base rail to this assembly adds considerable strength to the joint at the post base.

Complete Roof Assembly

One of the most difficult problems which faced the body builder of the past was the construction of a satisfactory all-metal roof. The solution of this problem using Parish B-Line of roof sections has resulted in a well-built and neat-appearing roof. This roof assembly is built up as a complete unit ready for the final bolting into place on the finished body.

Parts involved in the roof structure are few and simple to use. They consist of the No. 10 carline segments and No. 11 carline splice, the roof cap and corner cap and a strip of outside belt line used through the top center of the roof to provide a backing strip for the roof panel splice. Added to these is sufficient flat panel metal to cover the flat area on the top of the roof. Fig. 3 shows a general cross section through this roof and the assembly of the carline and roof cap.

Similar techniques have been employed in the construction and assembly of base rails, belt lines, liner slats, posts, carlines of lintels, doors and door frames, square rear end openings, thresholds and other body components.

A body manufacturer carrying a reasonable stock of standard Parish body stampings is equipped to make bodies to fit his customers' particular requirements. Also, he is in a position to repair quickly any damaged body made by the Parish method.

The Pressed Metal Institute is review-

CRYSTAL-CLEAR VISION AT ALL TIMES! that's the Scott Air-Pak

SELF-CONTAINED BREATHING APPARATUS

The lens in the full-vision face set of the Scott Air-Pak are ALWAYS clear.

The cool, clear, pure air prevents even the slightest mistiness—creating confidence—minimizing danger of stumbling or of confusing directions.

Throughout thousands of hours of rescue and industrial operational use, the wearers of Scott Air-Paks have been able to work with uninterrupted vision—permitting the highest efficiency and promptness of action.

—and that clear vision is one more reason for its widespread acceptance.

Your leading Safety Equipment House will be glad to demonstrate.

Bureau of Mines Approval No. 1308

...BREATHE FRESH, COOL AIR IN EVERY BREATHING HAZARD

NO OTHER BREATHING APPARATUS HAS ALL THESE VITAL ADVANTAGES

1. A quick-connect that cannot be cross threaded, easily and quickly engaged.
2. All-purpose working equipment—not just rescue apparatus.
3. A regulator—proved by thousands of hours of usage.
4. Fresh, cool air—not oxygen.
5. No complicated training or practice needed.
6. Absolutely clear lenses—no fogging.
7. A gauge *specifically designed* to provide a constant check on available air supply under all conditions.

Established in 1932

Scott

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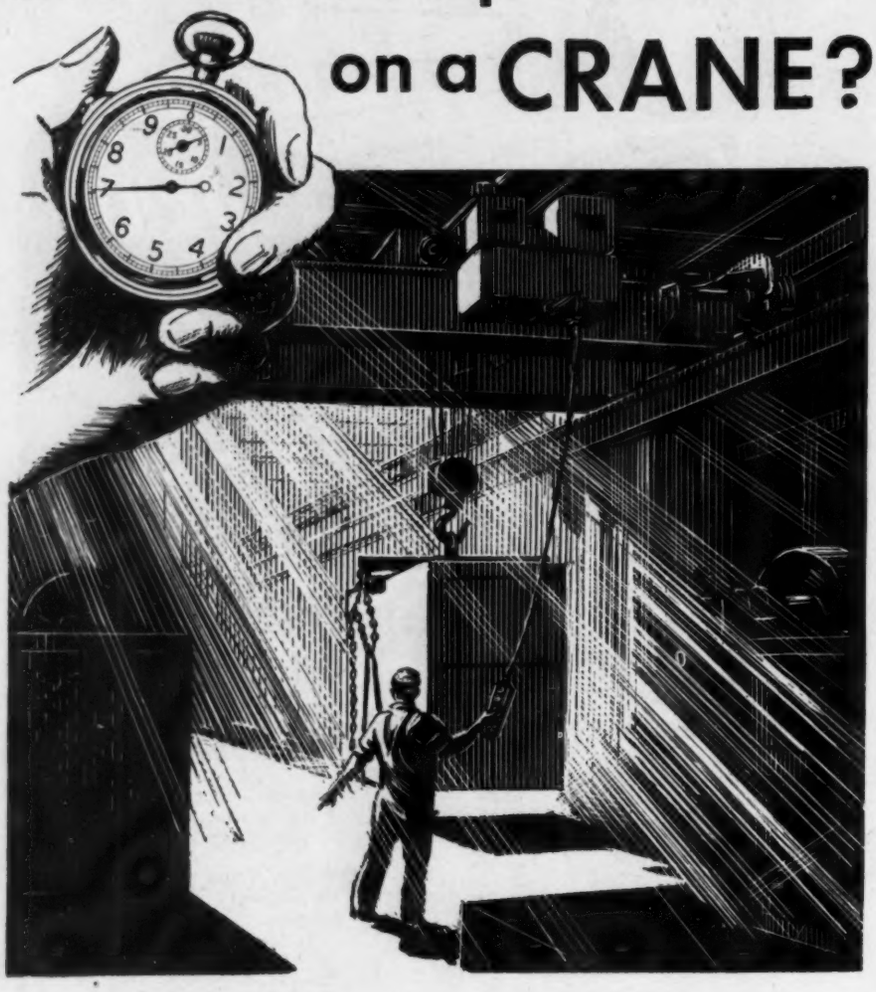
SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

234 ERIE STREET, LANCASTER, N. Y.

"THERE CAN BE NO COMPROMISE WITH QUALITY WHEN A LIFE IS AT STAKE"

Ever use a Stop Watch on a CRANE?



It isn't necessary to work in fractions of a second but it will pay you to check the time it takes to move heavy materials from one spot to another. No matter how efficient you are in operations involving manufacturing, processing or fabricating, there's bound to be a waste of time, money and manpower unless your handling costs are kept down.

Let trained, experienced Shepard Niles engineers assist you in making a study of your handling problems. Over a period of many years America's oldest builder of electric cranes and hoists has assembled data on the handling of materials in thousands of businesses. All this experience is available to you, without obligation, to help you select the crane best suited to do your job with ease, economy and efficiency.

Every hoist application is different. With a background of experience in installing electric hoists in every type of business, Shepard Niles can give you invaluable assistance in planning. This assistance is available without obligation.

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ing the growing opportunities for stampings in the field of transportation. By the use of mechanical fasteners, welding and riveting, standard mass produced stampings can be easily and economically assembled into completed units. Truck bodies, custom made to individual specifications, indicate how stampings are strategically solving production problems, and why they are playing a more and more important role in engineering design.

Pyrometer Measures Jet Engine Temperatures

Consisting essentially of an ordinary thermocouple junction around which is pressed a small, light silver shield, a newly developed pyrometer measures temperatures of high temperature, high velocity gas streams produced by gas turbines and jet engines. The main problem, according to the National Bureau of Standards which developed the device with the co-operation of the Bureau of Ships of the Navy Department, was preventing transfer of heat to or from the thermocouple junction by radiation in measuring temperature of hot gases.

Use of a silver shield overcomes these limitations since silver, being a good reflector and a poor emitter for radiant heat energy, keeps the temperature of the shielded junction nearly the same as that of the gas.

In experiments utilizing a stream of gas at 1500° F flowing with a velocity of 250 fps through a pipe with walls at 1200° F, accuracy was found to be within 5° F. Maximum dimension of the shielded junction need not exceed the diameter of the porcelain tube used to insulate the thermocouple wires from each other.

German Scavenging System Increases Engine Output

Greatly increased internal combustion engine output is reported for 2-stroke 2-cycle engines using a German "loop scavenging" system of blowing out exhaust gases. This fact is brought out in report PB-40374, "Supercharged Loop Scavenging," released by Office of Technical Services, Department of Commerce, Washington.

Inventor of the system, German Dr. Adolph Schnuerle, claims tests show this type of engine is capable of producing twice as much power per cylinder as a conventional 4-cycle engine. Requiring no valves, the "loop-scavenging" system includes ports in cylinder walls arranged in such positions and at such angles that the blast of scavenging air makes a reverse loop inside the cylinder, thus effectively cleaning out the burned gases.

no axe to grind

Because . . .

JESSOP manufactures

every type of tool material

for every cutting operation

● The Jessop representative, with *complete* line of tool materials to offer, has no axe to grind and therefore will recommend the most suitable material for your needs. You will find him cooperative and helpful in solving your machining problems. Send for him today . . . or write direct for descriptive literature.

JESSOP High Speed Steels JESSOP has been a leading producer of high speed steel since the first world war and has pioneered many improvements in this field. JESSOP High Speed Steels are furnished in all types, including straight tungsten, tungsten-cobalt, and tungsten-molybdenum analyses, and in all commercial shapes such as bars, sheets, drill rod, and finished tool holder bits.

JESSOP "Malta" Carbides Keeping pace with the latest developments in tool materials, JESSOP manufactures "MALTA" Carbide tools and tool tips for very high machining production. JESSOP "MALTA" Carbide tools and tool tips are furnished in standard sizes and shapes and grade of carbide for practically every machining operation. Special tools are manufactured to customer's specifications.

JESSOP "T & V" Cast Alloy An "intermediate" tool material, JESSOP "T & V" Cast Alloy is harder than high speed steel but tougher than cemented carbide, and is used for applications where machining speeds combined with good shock resistance are required. JESSOP "T & V" Cast Alloy tool bits are stocked for immediate shipment.

JESSOP STEEL COMPANY · SPECIALTY STEELS ·

Jessop Steel Company

WASHINGTON, PENNSYLVANIA

Tailor-made Specialty Steels

Small Business NEEDS

CLARK'S cost-cutting benefits

TRUCK LOADING
1,000 lb. Gas "Trucloader"

•Small Business...
SHRINKS HANDLING COST

A St. Cloud, Minnesota contractor cuts handling costs to a minimum with CLARK "Trucloader".

WAREHOUSING
1,000 lb. Gas "Trucloader"

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The nation's many franchise bottling plants save space, time and money by handling unit loads with CLARK fork trucks.

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1,000 lb. Electric "Trucloader"

•Small Business...
CUTS ACCIDENTS, DEMURRAGE

CLARK fork trucks speed the loading and unloading of box cars and trucks, and reduce accidents, damage and demurrage.

TRANSPORTATION
A new series of Towing Tractors

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SPEEDS MATERIAL FLOW

The new "CLARKAT" towing tractor is an ideal medium for savings on long hauls between sidings, docks and warehouses.

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Scoops Cranes Rams Clamps etc.

•Small Business...
MEETS VARIED NEEDS

The many attachments and devices for CLARK fork trucks enable a single machine to perform a number of different jobs.

CUT COST FACTORS WITH CLARK TRUCTRACTORS

and Small Business needs MATERIAL HANDLING NEWS...shows new machines, new devices, new methods that cut production cost.

CLARK TRUCTRACTOR
Division of CLARK EQUIPMENT COMPANY
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OTHER PLANTS – BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN

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FORK LIFT TRUCKS		ELECTRIC STEEL CASTINGS
TOWING, DUMP AND	DRILLS	METAL SPOKE WHEELS
SHOVEL TRACTORS	& GEARS	AXLES & HOUSINGS
RAILWAY TRUCKS		TRANSMISSIONS

Prices on CLARK products will not be advanced in excess of increased costs.

Metal Cleaning

(*Continued from Page* 101)

developed since 1930, found wide usage in spray and dip cleaning to remove light soils and inert materials. In these instances a fairly satisfactory metal surface is obtained. Also, most emulsion-type cleaners remove ordinary fingerprint residues and thereby prevent corrosion from this source. In most instances a solution temperature must be maintained at 180° or above to insure any satisfactory results.

It has been definitely proved by laboratory research, however, that emulsion cleaners will not remove a water soluble material, such a fingerprint residue, if it is coated with oil or greasy soil. As a result, rust develops on the fingerprint area subsequent to the cleaning operation.

The emulsion-type cleaner offers the economy of combination with water and removal of most inert and water-soluble materials with, in many cases, the added advantage of some protection against corrosion in connection with light cleaning problems.

Multiple-Phase System

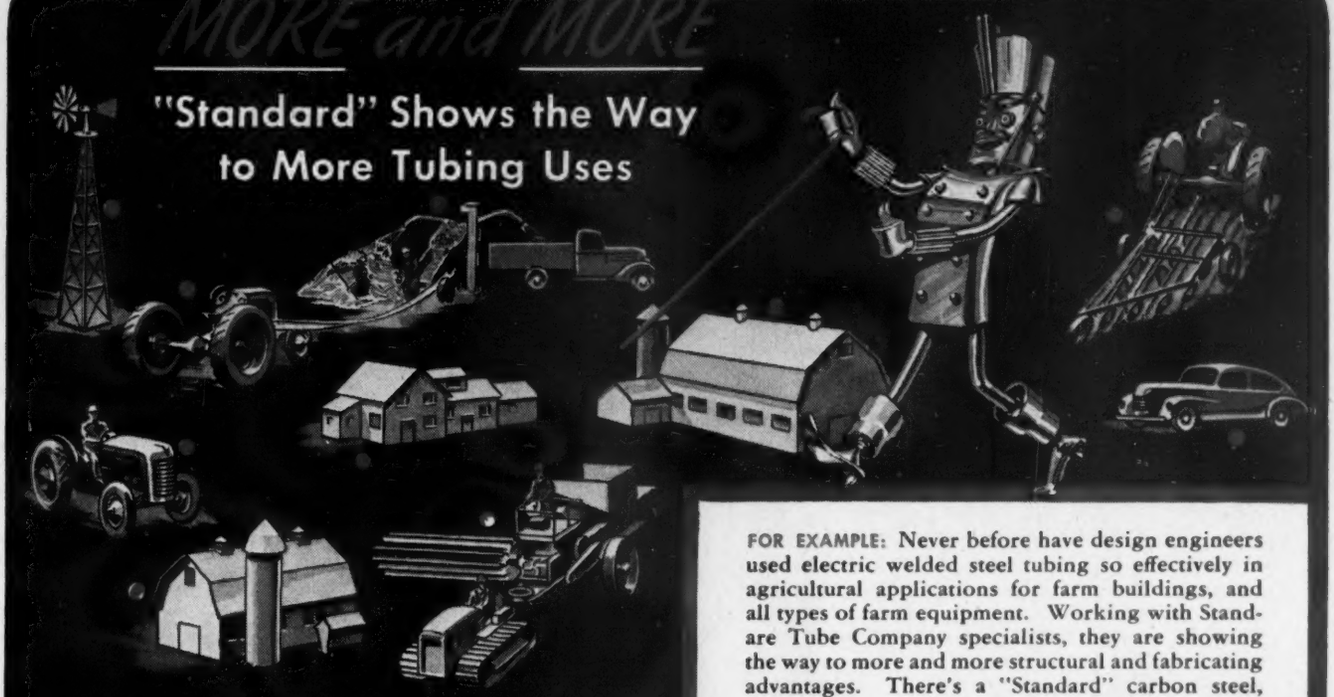
Last and most recently developed cleaner is the multiple-phase type. The result of years of applied research, this is a fundamentally new cleaner, bringing together in one system a composition including organic and inorganic solvents for mixture with water to produce a multiple-phase bath in which an upper layer comprises an unemulsified solvent layer and a lower layer comprises a dispersion or emulsion of organic solvents in the water.

This multiple-phase system may be applied to advantage in ordinary dip cleaning but it is best designed for use in spray washing processes, with the intake of the pump drawing from the lower phase. The separate phases in this system maintain their character as separate layers in the tank and though mechanically mixed in the spray application maintain their individual character at all times.

Surprising improvement in cleaning is achieved as a result of the use of this multiple-phase system. For example, it is found that a soiled metal surface is not wetted by an emulsion of hydrocabon in water but is readily wetted by a free or unemulsified solvent. Thus powdered iron disperses readily in the free or unemulsified solvent. Conversely, inorganic soil such as alundum, carborundum, tripoli etc. are not wet readily by the free solvent but disperse freely in the lower or emulsion phase. Finally, the surface tension of the emulsion phase in the multiple-phase system is less than that of the stable emulsion, and

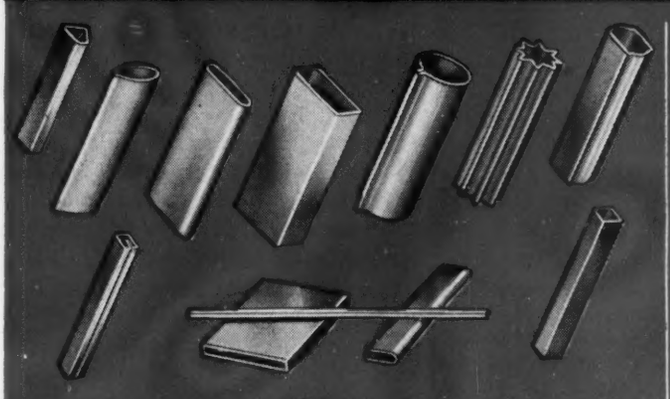
MORE and MORE

"Standard" Shows the Way to More Tubing Uses



STANDARDIZE WITH "STANDARD"—IT PAYS!

FOR EXAMPLE: Never before have design engineers used electric welded steel tubing so effectively in agricultural applications for farm buildings, and all types of farm equipment. Working with Standare Tube Company specialists, they are showing the way to more and more structural and fabricating advantages. There's a "Standard" carbon steel, stainless or N-A-X high tensile steel in the right shape, size and gauge to improve *your* results.



Choice of many shapes, sizes, gauges

Easy to process in many ways

Easy to bend in any direction

Easy to assemble by many methods

"Standard" tubing is *quality* tubing, with a weld of the same uniform strength and physical characteristics as the tube wall itself!

THE STANDARD TUBE CO.
Detroit 3, Michigan
Welded Tubing
Fabricated Parts
STANDARDIZE with "STANDARD" — It Pays

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STANDARD TUBE SALES CORP., One Admiral Ave., Maspeth, L. I., N. Y.
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UNION HARDWARE & METAL CO., 411 E. First St., Los Angeles 54, Cal.
THE PACIFIC PIPE COMPANY, 160 Spear St., San Francisco 5, Cal.
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Now!

HEAT TREAT HIGH SPEED STEELS

RIGHT IN YOUR OWN PLANT

QUICKLY AT LOW COST

No wasted time with *Quick Acting* JOHNSON Hi-Speed No. 130A Furnaces

Reduce Toolroom Bottlenecks with *Quick Acting* JOHNSON Hi-Speed No. 120 Furnaces

● Powerful Johnson Hi-Speed No. 130A reaches operating temperature fast to save time and gas. Gets the job done before conventional type furnace warms up. Available in two temperature ranges. The four-burner unit for steels, dies and tools requiring temperatures from 1400 to 2350° F. or the six-burner unit developing 1800 to 2400° F. for high speed steels exclusively. Burners fire under hearth to assure high uniform heat. Temperature easily regulated with accuracy. Counterbalanced door opens upwards. Firebox 7¾ x 13 x 16½ lined with high temperature insulating refractory. Complete, ready for action with Carbofrax Hearth, G. E. Motor and Johnson Blower.

4-Burner $295.00 6-Burner $325.00
F. O. B. FACTORY

Compact, powerful and remarkably low in operating cost, Johnson Hi-Speed No. 120 reaches 1500° F. in just 5 minutes from a Cold Start! Develops 2300° F. in 30 minutes. Ideal for heat treating high speed steels . . . for hardening any steel dies, tools or small metal parts. Two powerful burners fire under hearth to assure high uniform heat. Firebox 5 x 7¾ x 13½ lined with high temperature insulating refractory. Equipped complete with Carbofrax Hearth, G. E. Motor and Johnson Blower.

$145.50 F. O. B. FACTORY

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New JOHNSON Catalog
Describes the complete line of Johnson Furnaces for pot hardening, melting, annealing, and heat treating. Shows industrial gas burners for every purpose. Write for copy.

● *There is a Quick Acting Johnson Furnace for Every Heat Treating Need. Write for Descriptive Literature.*

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Please send me New Free Johnson Furnace Catalog.

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its interfacial tension against oily liquids is also materially less.

A multiple-phase system brings into play a new automatic extraction of soil from the circulated solution. Thus the solution can be used for much longer periods and can absorb a much larger dirt load before throwback of the soil on the work occurs.

An important feature of this new multiple-phase system resides in the fact that it has the ability to perform functions which neither of the two phases could perform separately or when used in succession. For example, the multiple-phase system will remove a fingerprint deposit which is coated with oil in a single operation, an important result. One of the outstanding characteristics of this new material resides in the protection against atmospheric corrosion which it imparts to the work. Highly finished steel parts are protected against rusting for at least several weeks, even during the humid season.

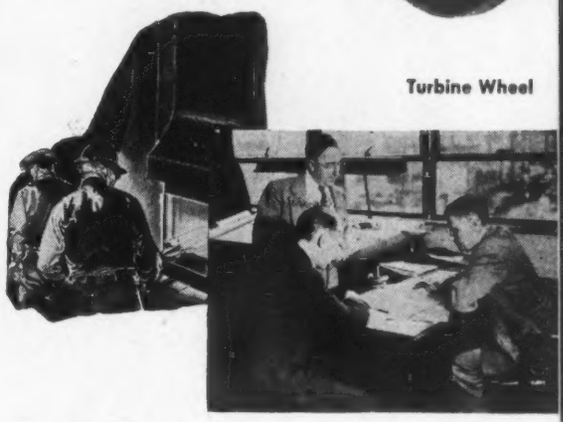
Test Soft Steel Panels

In laboratory tests, soft steel panels with a ground surface resisted rusting for several hundred hours when subjected to a temperature of 100° F and a humidity of 100 per cent, in spite of the fact that throughout the period they were coated with condensation. Apparently the protective agent is in the form of a mono-molecular or near mono-molecular layer because it cannot be detected by any method of inspection.

Using a multiple phase solution in a 2-stage washing machine, as early as 1940, one major automobile manufacturer cleaned ring and pinion gears, completely removing red leads and producing a dry, bright metal surface protected against atmospheric attack. During the latter part of 1939, the problem of combining plastics with metals was met with a multiple-phase solution which provided a metal surface receptive to bonding with plastics. A 65 per cent overall cost reduction was effected on steering wheel inserts.

To the engine manufacturer, the cleaning of pistons posed one of the most difficult problems, and in the aircraft field prior to the war this problem was met only with hand operations. By the application of the multiple-phase type of cleaning, aircraft pistons were thoroughly cleaned in a spray operation, followed by a light air blow-off, thus eliminating all hand washing and wiping for the first time. Since the widespread plating of die-cast and more delicate metals has developed, precleaning ahead of plating has become a major part of the plating process. With the use of a multiple phase solution, it is possible to remove caked buffing compounds

STEEL IMPROVEMENT
FORGED TURBINE BLADES ARE ALWAYS *Dependable*



The forging of turbine blades, buckets and wheels for gas turbine engines requires the employment of correct techniques for forging high temperature alloys to close tolerances. Long experience in forging intricate designs, plus specialized metallurgical and engineering skill, equip Steel Improvement Forging Engineers and Metallurgists to: (1) know the exact forging technique that should be utilized for developing fully the qualities, inherent in the alloy, that are required to meet the high stresses occurring in modern aircraft engines; (2) avoid costly experimentation in forging and heat treating blades, buckets and wheels; (3) advise and assist designers regarding the correct placement of parting lines and other design elements; and (4) adhere strictly to a policy of projecting a promise only when the accomplishment of the work can be substantiated by fact or experience or both. Consult a Steel Improvement Forging Engineer concerning "The Improvement of Metals by Forging."

Backed by over 33 years of forging production experience, Steel Improvement Engineers and Metallurgists have under their direction complete facilities for performing the highly specialized work of forging and heat treating turbine blades, buckets and wheels of high temperature alloys. *These facilities constitute a Turbine Forgings Division, the authority and responsibility of which encompasses all required phases of engineering, metallurgy, production and inspection to assure you dependable forgings.*

Turbine Forgings Division

DROP FORGINGS

THE STEEL IMPROVEMENT & FORGE CO.

942 East 64th Street CLEVELAND, OHIO

SALES OFFICES: NEW YORK · CHICAGO · MILWAUKEE · TULSA · LOS ANGELES

from all types of ornamental die-cast hardware, bringing to the plating cycle a bright part free from oxides or any foreign matter that cannot be easily shed in a light rinse or the customary electric cleaning employed in the plating cycle.

Recent results obtained in the cleaning of cold rolled tin plate are interesting. Under laboratory conditions, with plates taken directly from the rolling mill to obtain uniformity of soiling, minimum cleaning time using a multiple phase wash was reduced to 30 sec from 2 min previously.

Materials Handling

(*Continued from Page* 103)

involves the shipping of motor brackets from one of our foundries to another of our plants about 150 miles away. The foundry shipped these castings in bulk in trucks. The truck then delivered them to a storage point where they were transferred, by hand, to large wood containers. Containers were then taken to the storage bin and emptied by hand, and at the same time properly segregated. When an order came through to deliver castings to the production line the sequence of operations was reversed and all the handlings were repeated over again. There were a total of six manual handlings.

Approximately 12,000 castings were handled daily in this manner at a considerable cost. All this hand handling contributed to a 5 per cent breakage in the delivered castings. Since it was necessary to keep a 4 to 6 weeks supply of castings ahead of the line it was felt that it would be desirable to pick them up at the last foundry operation and ship direct to temporary storage and then to the production line with no intermediate handling.

During the discussions concerning the possible use of a container as a unit load the idea of a collapsible type container suggested itself. A ¼-in. to the foot scale model was made to prove the practicability of the collapsing idea as applied to a material container. Next logical step, of course, was to build the full size model for test purposes. This model of the collapsible container proved that the idea though revolutionary was practical.

The design agreed upon by our engineers as the one to submit for exhaustive tests and final development is shown in Fig. 2. The base of this container is the ordinary 8-way wire pallet readily available on the market. The sides are made of standard rod easily fabricated and assembled. Though designed for a 1500-lb load, it was actually subjected to a 3000 lb load test as the view shows. Weight of the container was cut from 230 to 135 and later to 125 lb.

Up to this point the development of the basic idea had taken place in the laboratory Westinghouse maintains for such purposes.* Now the question came up as to whether the container would, under actual operating conditions, do what our analysis and laboratory tests indicated. Accordingly, 25 of the containers were built and placed in service between the foundry and the plant as a field test. A summary of the delivery cycle revealed that costs of nine elements were reduced from 50 to 100 per cent; three remained the same, while seven showed some increase.

However, the overall analysis indicated a saving of approximately 45 per cent or about $93 per day. Breakage was reduced to less than 2 per cent. The time cycle from storage to production was greatly reduced. Formerly two to four men were used to load castings from the storage bins into large wooden boxes which were then transported by truck to the line. Now an entire container is picked up by fork truck and sent on its way.

Port time for trucks at both ends was

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
WIRE PRODUCTS • ALLOYS
Adequate Stocks!
Prompt Shipment!
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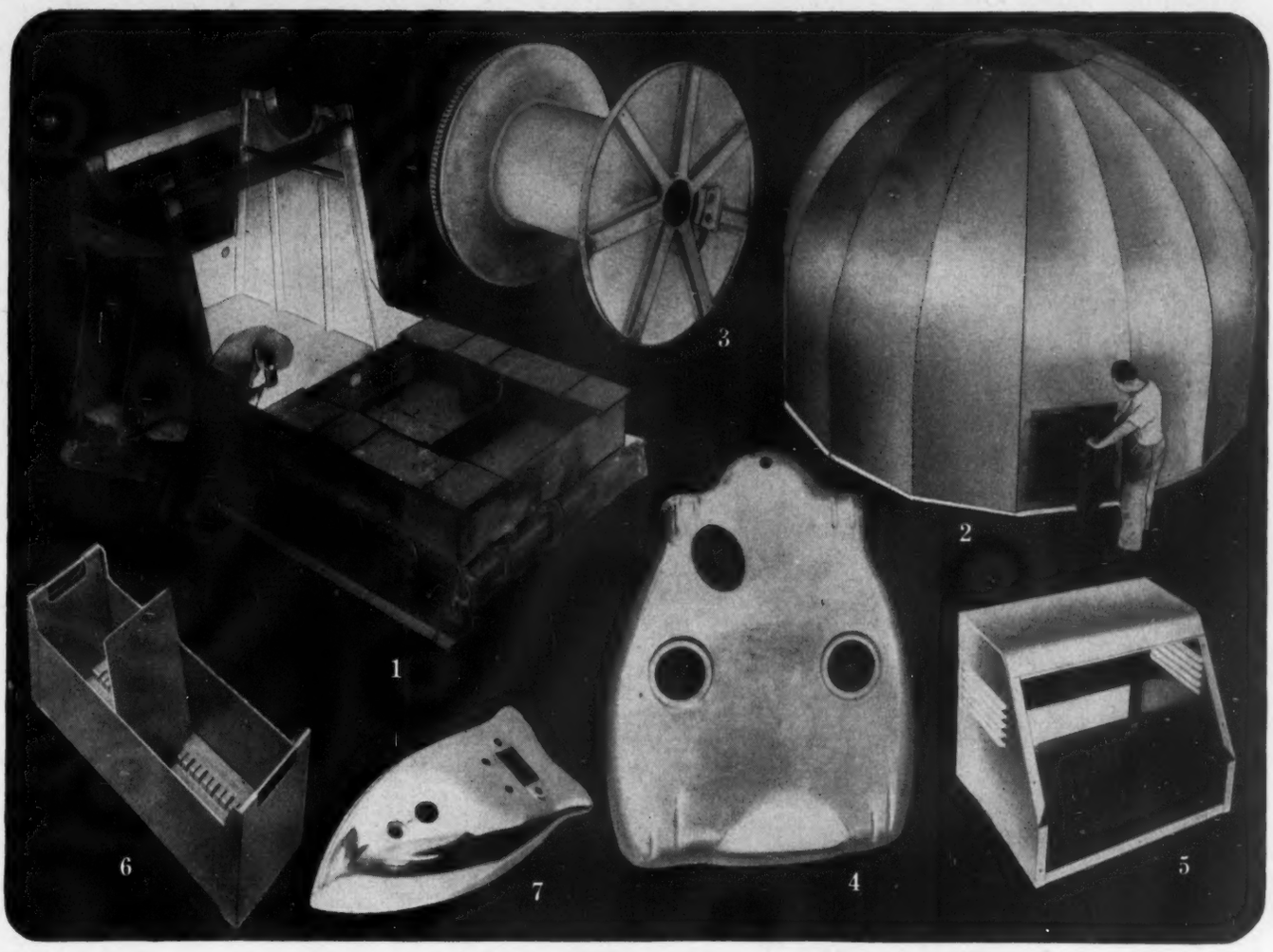
7 UNUSUAL METAL WORKING JOBS



Specialized Work—ranging from 14,000 lbs. to a few ounces—for exacting customers

Brandt's ability to solve out-of-the-ordinary metal working problems in an extreme range of sizes and metals is illustrated by the 7 products shown above. The aluminum electric iron stampings were mass-produced to close specifications on a rush order. In contrast, the 14,000 pound precision Weldments (1), were tailor made to exacting Naval specifications. The Protective Housings for Naval Guns (2) are huge 15 ft. diameter units of 16 gauge steel, produced on assembly line basis, and made in their entirety by Brandt.

The other products shown were made for Specialized Aircraft, Electronic, Marine and Office equipment. Widely different in size, metals, specifications and quantity, the production of each of these orders demanded Specialized Facilities.

1. 14000 lb. Steel Weldments
2. Protective Naval Gun Housings
3. Intricate Steel Weldments
4. Aluminum Aircraft Fuel Tanks
5. Steel Radio Jackets
6. Steel Office Files
7. Aluminum Iron Housings

***ALL UNDER ONE ROOF**

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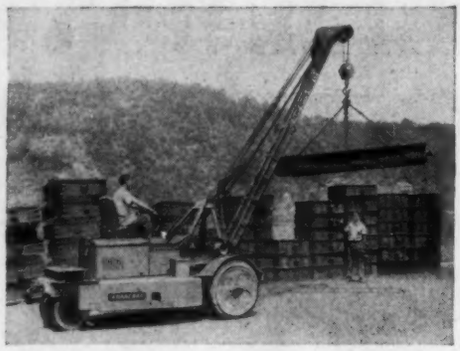
BALTIMORE

CHARLES T. BRANDT, INC., 1700 RIDGELY ST., BALTIMORE-30, MD.

Precision METAL CRAFTSMEN SINCE 1890 ★ ★ ★ ★

KRANE KAR Handles Steel Stock and Forms at a Cost of Only 8¢ per TON

Case studies at foundries, forges, industrial plants, and shippers show **KRANE KAR** handles all types of loads at a cost of about 8c per ton. **KRANE KAR** speeds loading and unloading of freight cars, trucks, trailers; speeds tiering, stacking, and storing inside plant or in yard; speeds plant maintenance and repairs.



KRANE KAR lifts, swings, carries, and places loads of all shapes and sizes up to 10 tons. 9 to 37 ft. booms or adjustable telescopic booms; pneumatic or solid rubber tires; Gasoline or Diesel. Electric magnet, clamshell bucket, and other accessories available. Ask our nearest agent how to prune your materials-handling costs. Write for Bulletin No. 69.

USERS: U. S. Steel, Bethlehem, Kropp Forge, Boeing Aircraft, Pullman-Standard, General Motors, Ford, Chrysler, Carnegie-Illinois, Fargo, Coeur d'Alene, Birdsboro Steel, DuPont, etc.

THE ORIGINAL SWING BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

2½, 5, AND 10 TON CAPACITIES

KRANE KAR

TRADE MARK REGISTERED

SILENT HOIST & CRANE CO., 849 63rd ST., B'KLYN 20, N.Y.

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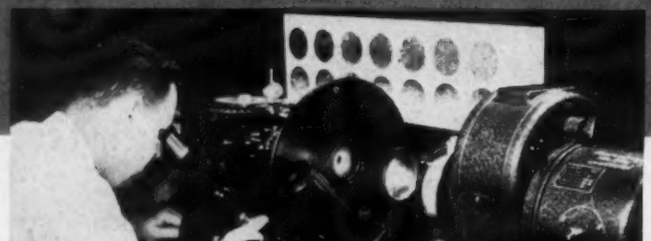

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Hypoid • Herringbone
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Worm Gears

Here in the Fairfield laboratories, engineers carry on a continuous program of research . . . checking materials and methods, laboring to maintain Fairfield's enviable position as a producer of high quality gears. Their efforts are your best assurance that with Fairfield most of your gear troubles never happen. Fairfield has a broad experience in the manufacture of gears for a wide variety of applications. Your request for information will be given prompt, professional attention.

FAIRFIELD MANUFACTURING CO.
303 South Earl Avenue
LAFAYETTE INDIANA

FAIRFIELD for FINE GEARS

reduced greatly since loading and unloading is done by unit load and not by individual piece. A solid truck load can be loaded in 20 min.

This example is but one isolated materials handling problem—how it was approached and how successfully solved. It can be seen that this problem was attacked from a fundamental engineering point of view. A device was not just picked for the job and put to work. But by combining our efforts with the equipment supplier, the company engineered the job from the ground up to meet specific needs.

From paper presented before Materials Handling Exposition, Cleveland, Jan. 16, 1947.

Alloying Elements Resist Corrosion Best as Solids

Alloying elements are likely to be most effective in improving corrosion resistance of iron only when they are in solid solution. So stated F. L. LaQue, in charge of corrosion engineering section, development and research division of International Nickel Co., New York, in a lecture given before the Boston Chapter of the American Society for Metals.

Limit of solid solubility at atmospheric temperatures determines to a considerable extent which elements are added to iron commercially to improve its corrosion resistance, he added, this accounting for the relatively large alloying amounts of chromium and nickel and relatively small amounts of molybdenum, copper and phosphorus.

To show that the presence of one element may increase solubility of another, Mr. LaQue pointed out that nickel can act as a carrier for substantial amounts of copper and has been used to incorporate silver in chromium-nickel-iron alloys. Accordingly, complex alloys may contain larger percentages of some alloying elements.

Metal Shortages Retard Power Sprayer Making

Although facilities of the industry are adequate to produce the increased number of hand and small power sprayers needed, the manufacturers of such equipment report that current shortages of tin plate, galvanized sheet, small motors and other essential items has somewhat retarded production.

This was brought out at the National Sprayer and Dust Association meeting held recently in Chicago.

Introduction of new chemicals has been met by improvements in the design of hand and small power sprayers and dusters. Various new models are expected to be released on the market as the material situation permits.

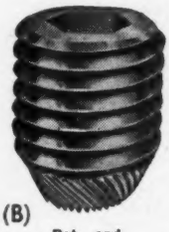
(A)

UNBRAKO

Reg. U. S. Pat. Off.

THE *Knurling* SAVES TIME EVEN WITH OILY, GREASY FINGERS

(A) The "Unbrako" Socket Head Cap Screw is a time-saver because the knurled head provides a slip- and fumble-proof grip—even for the oiliest and greasiest fingers. It can, therefore, be screwed-in faster and farther before it becomes necessary to use a wrench . . . assures a more compact, neater fastening with decided savings in material, space and cost.



(B)

Pat. and Pat. Pend.

(B) Self-Locking "Unbrako" Socket Set Screws—with knurled Cup-Point—hold fast because the knurled point digs in and stays tight, even under the most chattering vibration.

(C)

Pat'd. & Pats. Pend.

(C) "Unbrako" Socket Set Screws—with knurled threads—are also self-locking. They are for use where the point cannot be knurled. These and the Socket Head Cap Screws are available in sizes No. 4 to 1½". Write for your copy of our "Unbrako" Screw Products catalog.

Knurling of Socket Screws originated with "Unbrako" in 1934.

Kits: Pats. Pending

You can't screw socket screws in or out without a hex socket wrench—so why not get our No. 25 or No. 50 "Hallowell" Hollow Handle Key Kit which contains most all hex bits.

"Unbrako" and "Hallowell" products are sold entirely through distributors.

OVER 44 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

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●Handles intricate cuts easily. No distortion. Unusually strong and durable, geared to give great power with little effort. Metal can turn any direction while cutting.

●Machines available for 14 ga., 10 ga., and 3/16 in. material.

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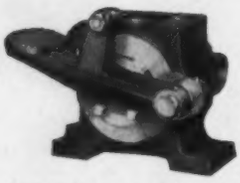
HANNIFIN VALVES

for all air cylinder control requirements



Rotary Type—ratchet action for advance and return of cylinder; 3 sizes.

Hand Operated Valves; 15 sizes and types.

Foot Operated Treadle Valve; 9 sizes and types.

Spring Return Foot or Hand Operated Valves; 6 sizes and types.

Duplex Valve for two cylinders.

Manifold Type, bottom connection. Used individually or with made-to-order manifolds; 9 sizes and types.

The Hannifin Packless Valve Design *insures* year after year of maintenance-free service. 48 low cost models to choose from. Request Bulletin 57-A.

HANNIFIN CORPORATION
CHICAGO 24

Heat Treating Fasteners

(*Concluded from Page* 106)

closed, the machine is started and the work is spun (centrifuged) first in one direction and then in the reverse direction. This causes all excess finish not adhering to the parts to be thrown off and to flow back into the tank. Spinning requires only 80 sec; the machine can handle about eight to ten loads per hour, including loading and unloading time.

Immediately after spinning, the basket of parts is removed and the work is baked in an oven for 20 to 30 min at 285° F. Then the work is returned to the machine and is given a second identical coat in the same manner, the second coat being baked on, the same as the first. Products thus treated readily withstand 100 to 150 hours or more of 20 per cent salt spray in the latest type of spray cabinet operating at 95° F under standard conditions.

Parkerizing is done after grease removal in an Oakite cleaner, in perforated barrels half filled with parts slowly rotating for 20 to 30 min in a standard Parko solution heated to 190° F. After this phosphate treatment, the parts are rinsed in water and then are given a short dip in dilute chromic acid (1 lb to 250 gal of water) both the rinse and the dip being at 190° F. This final dip stops any possible continuing chemical reaction of salts left from the Parkerizing. Parts treated in this manner are dumped in baskets and then are centrifuged to remove any moisture remaining on them.

Where, as in parts of certain shapes, there is some tendency for parts to stick together as a result of the zinc chromate coating in bulk lots, the baked parts are fed through a simple machine. As they drop from the hopper, a stream of compressed air blows them at considerable velocity against a surface at the far end of a horizontal tube. This impact causes those that adhere to break free and the parts then fall into a container and are ready for shipment. Parts that are to undergo this treatment are dumped on the table of the machine and are fed into the hopper by hand.

With the foregoing setup, both heat treating and finishing are done rapidly and with high economy, yet quality is maintained at a high level, helping to insure uniformity and excellence in performance.

—o—

New methods developed for crimping, bending edges and welding have made it possible to produce aggregate wire screens with precision openings. Made by Woven Wire Fabrics Division of John A. Roebling's Sons Co., Trenton 2, N. J., screens, called Roe-Flat, provide maximum metal surface to abrasive wear.

"take it" from Chief Keokuk....

Repeat shipments are of absolutely like analysis... that's KEOKUK Electro-Silvery

FOUNDRIES

30-pound Keokuk Electro-Silvery Pigs for charging mechanically into the cupola. Easily broken into two or more pieces, handled by magnet and measured by weight. Regular or alloy analysis.

12½-pound Keokuk Electro-Silvery Piglets so uniform in weight that they may be charged into the cupola by count, eliminating weighing operations. Handle by magnet. Regular or alloy analysis.

STEEL PLANTS

60-pound Keokuk Electro-Silvery Pigs for blocking the open hearth heat. For equal distribution of silicon and best temperature meltdown. Handle by magnet. Regular or alloy analysis.

Write today for complete information.

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NEW STAINLESS STEEL
COMBUSTION CHAMBER
INTRODUCED BY DRAVO
PITTSBURGH, PA.: Stainless steel, scientific development which aided the advancement of jet propulsion and turbo-supercharging is now being utilized to provide more efficient and durable combustion chambers in Dravo Counterflo Oil and Gas Fired Heaters. Effective immediately, industrial and commercial
Dravo Heaters
AVAILABLE IMMEDIATELY

In fabricating the combustion chamber of Dravo Heaters from stainless steel, many extra years of highly efficient operation have been added to the life of a direct fired heater that already has proved its worth in thousands of industrial and commercial installations.

Other advantages include: **elimination of refractory with its troublesome maintenance; reduction of overall size and weight of heaters; greater flexibility of application.** For descriptive bulletin CQ-516 write Heating Section.

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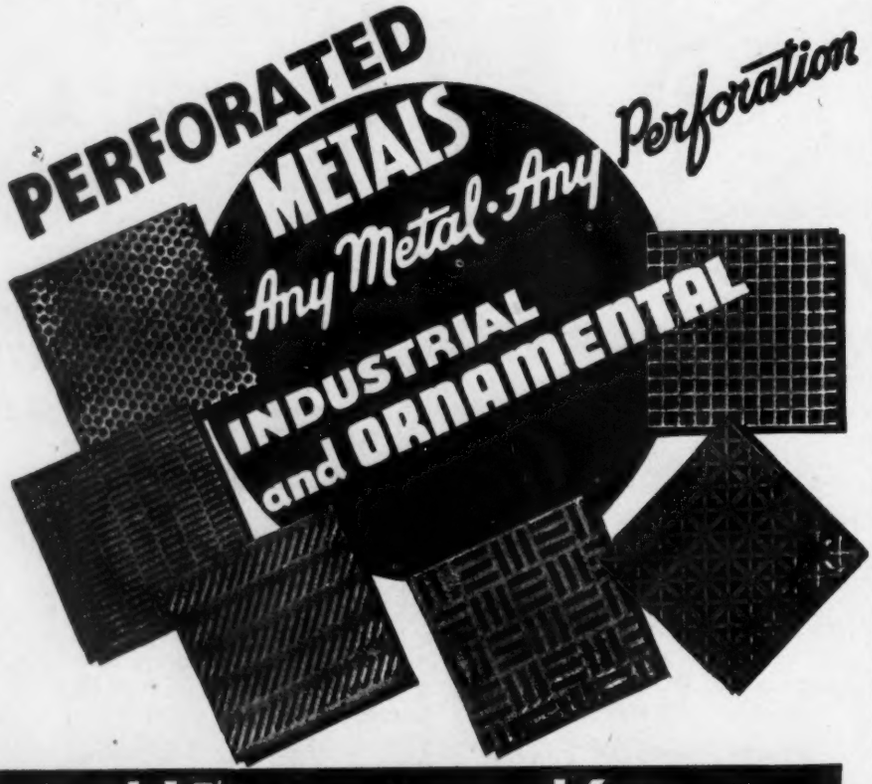


The Harrington & King PERFORATING Co.

5634 FILLMORE STREET, CHICAGO 114 LIBERTY ST., NEW YORK

Refining Low Carbon Heats

(*Concluded from Page* 108)

In the oil industry, Mr. Keith explained, seven oxygen plants are under construction ranging from 10 to 1000 tons output per day. No skill is required to operate an oxygen plant, he stated. He emphasized that cheap oxygen is a reality for blast furnace and open-hearth use.

An experiment recently conducted at the Gary Works of Carnegie-Illinois Steel Corp. on rimmed, mechanically capped, and semikilled low carbon steels to determine the effect on slab surface quality resulting from increased pouring rates was described by C. J. Hunter, chief metallurgist of the plant. Several heats were made and poured through four nozzle sizes ranging from 2 to 4 in. diameter. Most of these heats were teemed into 30 x 48-in. molds, but several 31 x 56-in. molds were included. The amount of conditioning required on each slab was recorded. In the case of rimmed steel surfaces removal ranges from 15 per cent for the heats poured through 2-in. nozzles to 2.4 per cent for those poured through 4-in. nozzles. The beneficial effects are nearly equally distributed between a reduction of scabs and breaks.

Charactersitic of the smaller nozzle sizes is a hump in the early part of the pouring order with fastest pour appearing in the center portion of the heat. In all nozzle sizes the pouring time increased considerably as the end of the heat approached. Indications are that faster pouring has a beneficial effect on surface even on an ingot to ingot basis.

From these results the speaker concluded that in a 2 x 4-in. range of nozzle sizes, slab surface quality on the grades studied improves as nozzle sizes and pouring speeds are increased when teeming into molds of comparatively large cross-sectional area.

Advantage is being taken by several open hearth shops of the oxyacetylene machine designed for cutting metal 50 to 60 in. thick. One steelmaker reported its use for cutting up slag buttons out in the stockyard. Another operator who had ten 18,000-lb buttons put lances to work and completed the cutting in 12 months. Drop ball action was of no account. He mentioned that buttons in a cold state required about two to three days for cutting up compared to two to three hr when hot. At another shop the cutting torch is suspended from a jib crane and a preliminary test showed that a 10,000-lb button could be cut in 1 hr. In order to cut down the setup time plans call for the arrangement of five or six buttons in a circle so that cutting can be continued without interfering with loading of cut sections.

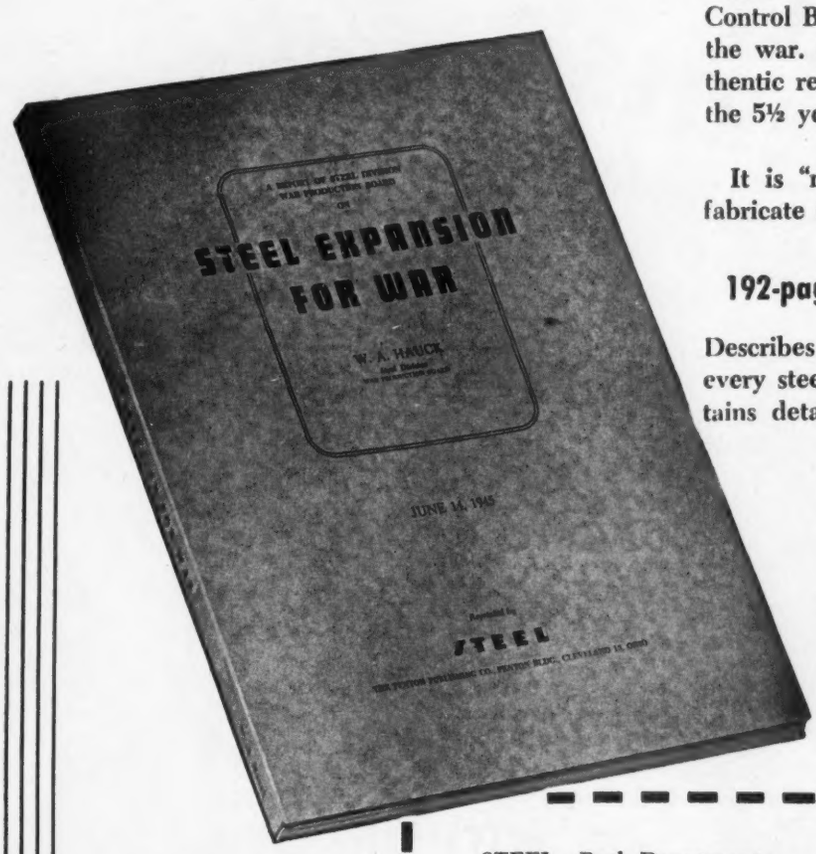
The Steel Situation

THE adequacy of steel supplies is a subject of continued concern for both consumers and the steel industry itself. Many consumers unable to obtain steel, feel that capacity should be increased considerably. The steel industry, on the other hand, recalls vividly that 62 per cent of its capacity was idle during the five years beginning with 1930 and that 41 per cent was not used in the 5-year period ending with 1939.

During the war, some 15,000,000 tons of steel ingot capacity were added, most of which has been acquired by individual steel companies on an outright purchase or lease basis. Since the close of the war, the steel industry has spent many millions of dollars on new equipment and modernization of existing facilities.

In studying the future steel situation, everyone should read the report written by Mr. W. A. Hauck, now chief of the Iron and Steel Branch of the War Assets Administration and formerly chief of the Steel Control Branch of the War Production Board during the war. He has prepared the only official and authentic report on expansion of the steel industry for the 5½ years from January 1, 1940 to June 30, 1945.

It is "must" reading whether you produce steel, fabricate it or are an investor.



192-page Handbook and 18-page Supplement

Describes in detail the added capacity and cost of every steelmaking facility built during the war. Contains detailed list of companies making every type of finished steel product, plus latest data on new mills now being constructed. Included is much heretofore unpublished information on new and revamped facilities of hundreds of plants, including those in ore, ore transportation, coal and coke, refractory, ferroalloy, scrap, foundry and forging industries. It is illustrated by 148 photographs, numerous charts and tables.

Price $2.00 *Postpaid

STEEL—Book Department
Penton Building, Cleveland 13, Ohio

Please send ..... copies of STEEL EXPANSION FOR WAR, by W. A. Hauck, postpaid. (Single copy, $2.00*—discount on 10 copies and over.)

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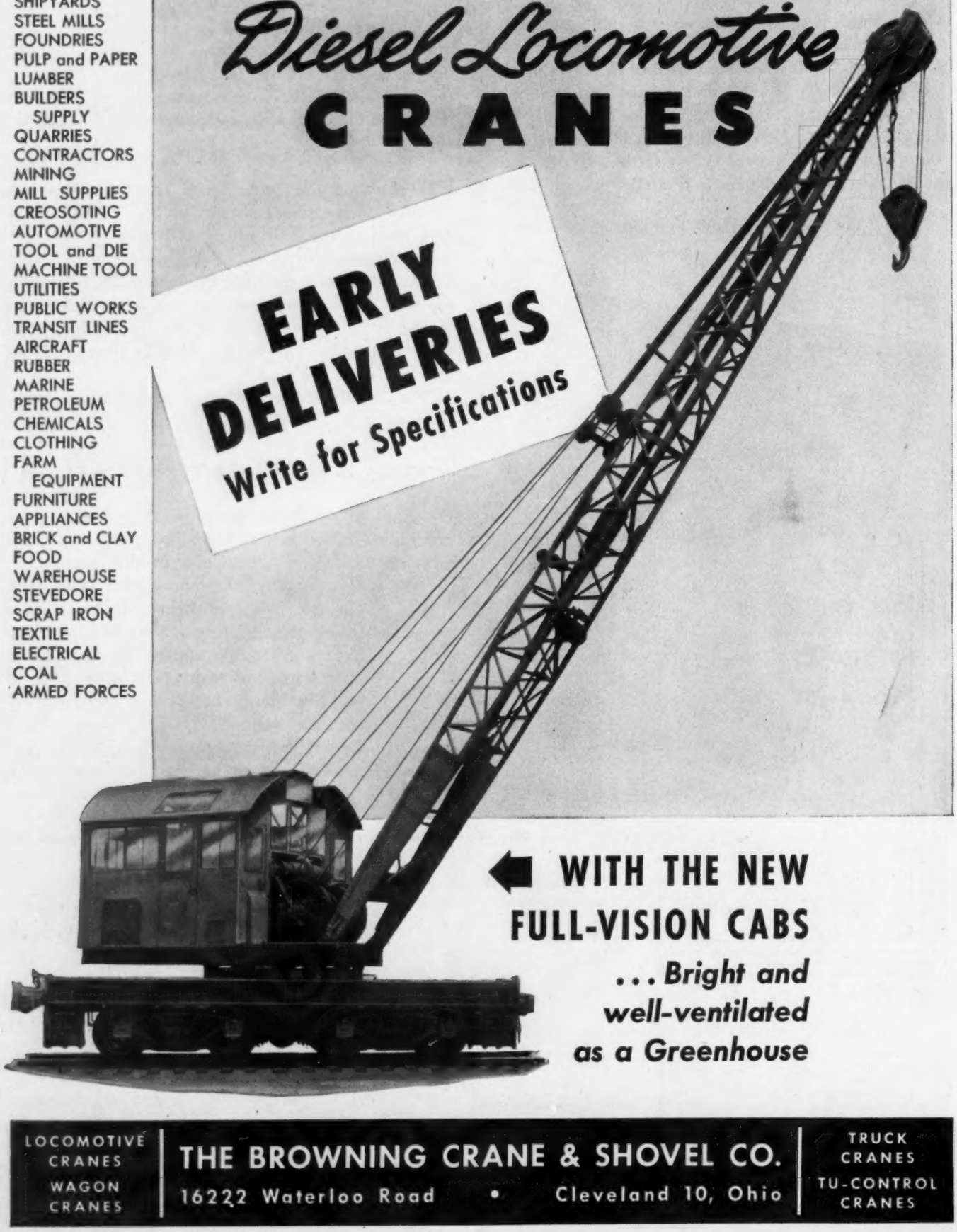
Write for Specifications



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LOCOMOTIVE CRANES
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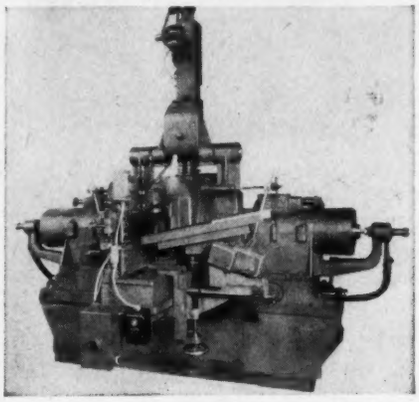
TRUCK CRANES
TU-CONTROL CRANES

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 156

1. Wet Grinder

Featuring a combination magnetic vibrator and automatic chain feed, a new double spindle wet grinder introduced by Charles H. Besly & Co., Chicago, uses oil as a coolant. It is capable of turning out twenty-four hundred 8-in. double and drop forged engineers wrenches or similar parts per hour. Each wrench is

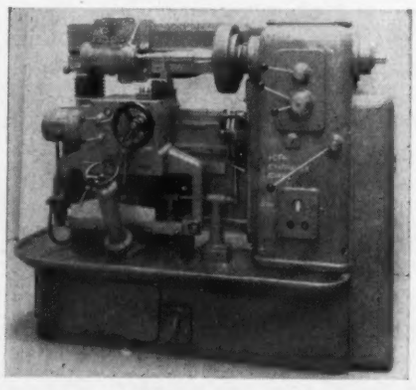


brought to the power chain feed by pressure of the wrenches behind it.

Parts are guided straight through the grinder and grinding wheel wear is evenly distributed. Thus the parts emerge from the grinder flat parallel and close to a given thickness, facilitating subsequent polishing operations.

2. Hydro-Copying Lathe

Designed for tungsten carbide tooling, the hydrocopying lathe, manufactured by George Fischer Steel & Iron Works Std, Schaffhausen, Switzerland (represented in this country by Cosa Corp., Chrysler building, New York 17) has a rigid



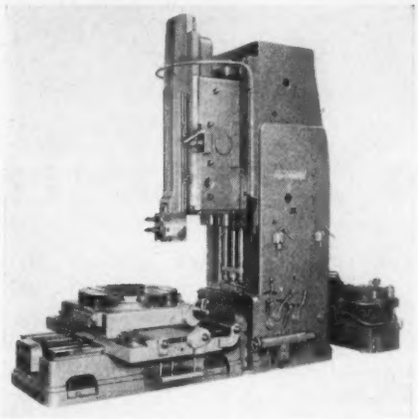
construction permitting operation at maximum cutting speed. Lathe, which is suggestive of a milling machine, has joined tail and head stocks, braced by an overhead yoke.

Tool holding assembly rises from a point below the work piece to bring the tool into contact from a point directly under it. It has a hydraulic copying system and vertical tool movement. Tool itself is ground to a negative rake and is fixed in such a manner that chatter is eliminated.

By means of simple and inexpensive templates, the lathe operates on the reproducing principle. Work piece is held between centers at each end and is driven by self-centering claws.

3. Hydraulic Slotter

Ram cutting and return stroke speeds are infinitely adjustable over a wide range on the 36 and 48-in. stroke Hy-Draulic slotters introduced by Rockford Machine Tool Co., Rockford, Ill. Mas-



sive column design provides rigidity for the heaviest duty work. Ram may be set for travel in a vertical plane or in any tilted plane up to 15 degrees off vertical.

Because the ram is hydraulically driven, stroke lengths are easily set by valve control. Column location of the push-button panel centralizes all electrical and hydraulic controls. Inching control of the ram is provided for easier setup. Table provides rotary, transverse and longitudinal work feeds.

4. Spectrometer

Rapid and automatic analysis of various elements in a metal alloy is possible with the direct reading spectrometer manufactured by Baird Associates, University road, Cambridge 38, Mass., under license from Dow Chemical Co., Midland, Mich. This is accomplished by measuring electronically the intensity of spectrum lines.

Individual spectrum lines necessary for analysis can be isolated even in the complex iron spectrum, and their intensity measured with electron multiplier phototubes. Output current of the tubes charges a capacitor which, at the proper time, discharges into a meter reading directly in percentage concentration of the alloying and residual constituents.

5. Hand-Guided Tractor

Ample power for hauling heavy trailer loads is provided by the Worksaver storage battery powered intra-plant tractor announced by Yale & Towne Mfg. Co., Philadelphia. Unit's three wheels are 10

in. in diameter with 5 in. rubber tires for full traction. With only 30 in. between axles, a short turning radius is a feature. Principal use of tractor is expected to be for transportation of loads which are too heavy for manual pushing and too ungainly in shape to be handled on platform or fork trucks.

6. Coil Winding Tester

A magneto coil winding tester with all controls on the front panel and which has an ammeter centrally located between

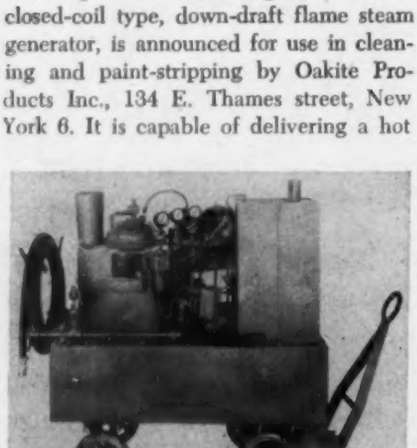
both sets of spark gaps, enabling operator to watch spark and read the meter at the same time, is announced by Jack & Heintz Precision Industries Inc., Cleveland 1. Its power switch and condenser switch are separated by the rheostat control knob.

Test lead wires are brought out from one side of the cabinet; battery and motor-breaker cords from the other. File

attached to back of instrument gives information needed to test windings of 16 different makes of magnetos.

7. Steam Cleaning Unit

A vapor steam cleaning unit, an enclosed-coil type, down-draft flame steam generator, is announced for use in cleaning and paint-stripping by Oakite Products Inc., 134 E. Thames street, New York 6. It is capable of delivering a hot



vaporized spray in either wet or dry state under pressures up to 200 lb.

After initial throttle setting, operation is completely automatic. Down draft flame in triple insulated fire chamber provides rapid steam generation. Unit is available as stationary, shop-wheel mounted, or trailer mounted models. A 3/4-hp, 60 cycle, 110-220 v ac motor is mounted on the unit.

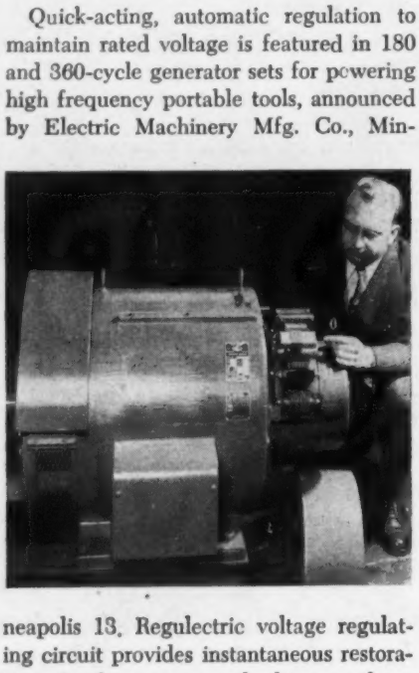
8. Steel Belt Conveyor

An all steel conveyor with sheet steel belt plates linked together by a simple type of link which gives flexibility, strength and ease of maintenance, is announced by Steel-Parts Mfg. Co., 222 South Morgan street, Chicago 7. Belt has flat working surfaces and cannot slip as it is geared to the driving sprocket. Drive sprocket and motor are enclosed and edges of belt are protected by a guard rail.

Each belt link is of 18-gage, cadmium plated steel and has its own set of steel rollers. Conveyor is constructed in standard 5-ft sections, any of which may be removed or added to the unit in a short time. Width from 6 in. up are manufactured. Units will handle 50 psf, but for heavier loads up to 300 psf or where impact is a factor, a heavy duty Mogul is built of 14 gage steel for the added weight. They may be used for flat or inclined service and for return service on lower belt.

9. High Frequency Generator

Quick-acting, automatic regulation to maintain rated voltage is featured in 180 and 360-cycle generator sets for powering high frequency portable tools, announced by Electric Machinery Mfg. Co., Min-



neapolis 13. Regulectric voltage regulating circuit provides instantaneous restoration of voltage to normal whenever there is a change in load.

Ratings of generator sets are 31.3 and 63 kva, in standard voltages of 240 or 480 at 180 or 360 cycles. In illustration, end cover has been removed from 31.3 kva, 180 cycle generator to show elements of built-in voltage regulating circuit. Circuit has no moving parts and requires no maintenance or adjustment of voltage.

10. Pressure Recorder

The Syncro-Marker Pressuregraph, a development of Electro Products Laboratories, 549 West Randolph street, Chicago 6, reproduces on the screen of a cathode ray oscillograph an accurate picture of pressures in operation during and after the explosion, as well as relating these variations to definite indicators of time, engine speed, top dead center, etc. Instrument may be used to make pressure studies of engines, compressors, pumps, fuel explosions, displacement of moving parts, etc.

High pressures, or transients, may be fully revealed and studied with the Synchro-Marker which with an additional

system of marker signals, enables the engineer to compute from definite references which are expressed in either 5 degrees of angular velocity (engine rotation) or in milleseconds measured by 1 in. on the oscillograph screen.

11. Welding Torch

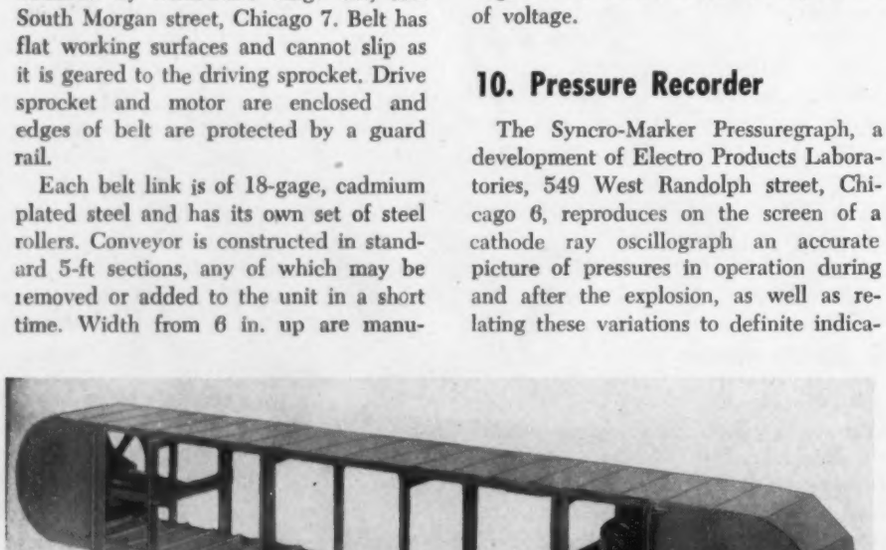
Designed for inert gas shielded arc welding, a new water cooled Heliarc welding torch, introduced by the Linde Air Products Co., 30 East 42nd street, New York 17, makes use of a light and flexible power cable capable of carrying 250 amp. A safety fuse is inserted in the water discharge line to shut off the power if water flow should stop. Direct current, straight or reverse polarity or high frequency stabilized alternating current may be used.

12. AC Bridges

Two alternating current bridges designed for measuring the power factor and capacitance of electrical insulting equipment while under high-voltage stress are announced by General Electric Co., Schenectady, N. Y. Instruments may be used for production testing of cable, transformers, motors, or of insulating materials such as paper, oils, varnished cloth and plastics.

Two types of bridges are available—the general-purpose bridge and the cable bridge. General purpose bridge covers a capacitance range of 0.0000025 to 1.0 mf. Furnished ready for operation, it includes a high-voltage supply, a standard air capacitor, a crest voltmeter, a bridge network, and a bridge balance detector, all enclosed in a steel cabinet.

The cable bridge is designed for testing high-voltage cable in the factory or in the laboratory before installation. Resistance arms of the bridge carry large charging currents produced when long lengths of cable are tested at high



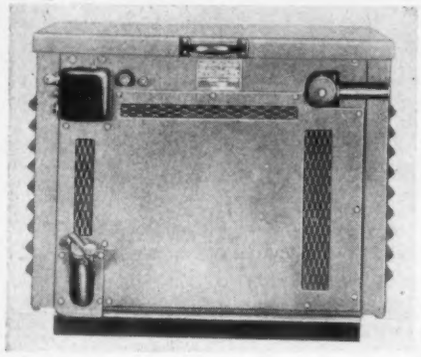
voltage. The cable bridge covers a capacitance range of 0.000025 to 2.0 mf. It consists of the bridge network, null balance indicator, and indicating crest voltmeter, all enclosed in a metal cabinet.

13. Melting Pot

Aluminum, white metal, zinc, etc., may be melted in the pot of 50 lb capacity announced by Kindt-Collins Co., 12651 Elmwood avenue, Cleveland 11. Heavily constructed pot is normalized to prevent cracking. Use of 2-man bale permits pouring of metal from same pot in which it was melted, minimizing agitation and reducing porosity.

14. Gas-Electric Power Unit

Gas-electric drive power units for motorized hand-lift trucks are announced by Ready-Power Co., Detroit. Machine is



small version of standard units used on conventional lift trucks.

A feature of the unit is that the operating speed may be adjusted to suit plant working conditions and loads being carried. "Walking speed control" gives three speeds that are entirely independent of control mechanism of the truck.

Housed in heavy steel enclosure and powered by a 4-cylinder, gasoline engine, complete with self starting, unit weighs 600 lb. It requires a space approximately 14 x 24 x 32 in.

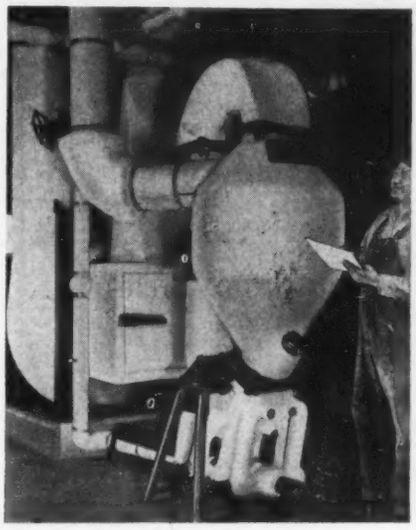
15. Coating Unit

Suitable for the deposition of magnesium fluoride on optics, the preparation of evaporated metal films and other applications requiring low pressure bell jar equipment, the type 3102 coating unit, made by National Research Corp., 100 Brookline avenue, Boston 15, has a chromium plated base plate to prevent rusting when not in use. Unit embodies a continuously operating, 6 in., high speed diffusion pump and a large combined roughing and backing pump.

Included with machine are two sets of filament posts, a 110 v power supply for resistance heaters or other uses, a high capacity, high voltage discharge unit and a bellows turning mechanism. A vacuum safety switch insures that high voltage can be turned only while bell is evacuated. Bell jars are of either pyrex glass or steel.

16. Coal Pulverizer

A new pulverizer developed by Blaw-Knox Co., Pittsburgh, enables power and steam plants to feed coal to their boiler burners in a fluid stream. Known as steam



jet fuel pulverizer, it is produced in two models—a loop and a circular type unit. Units have no moving parts, except for a screw drive that feeds fuel into the unit.

Superheated steam does the pulverizing. Powdered coal is then entrained by steam and delivered to the burners in a fluid stream, similar to a gas. Streamlike movement permits precise control and achieves complete combustion, reducing smoke. Pulverizer operates on either wet or dry coal and is adapted for capacities up to 10,000 lb of fuel per hour as required. An electric eye, trained on the flame at the boiler burners, insures automatic stoppage in event of loss of ignition due to any cause.

17. Battery Charger Control

Sectionalized control panels for battery charging, each section comprising a complete charging circuit, are announced by Electric Products Co., Cleveland 12. To add more circuits, it is necessary to obtain only a few frame bolts, extend the main power bus with a jumper and lengthen the control wires. Shipped completely assembled, panels are fastened to nearest wall by two angle iron brackets.

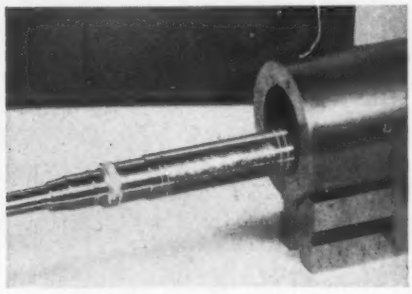
Each section measures 9 in. wide and is 76 in. high. Controls are mounted on front of the board within protecting covers. Covers are easily removed for inspection and maintenance. A signaling lamp on top of board indicates when circuit needs attention—either placing a battery on charge or removing a completely recharged battery.

FOR MORE INFORMATION

on products and equipment described in this section, fill in a card following page 156.

18. Profilometer Tracer

Microinch surface roughness measurements in deep bores such as hydraulic cylinders, camshafts and tubing are possible with the new tracer developed for use with the Profilometer made by Physicists Research Co., 321 South Main



street, Ann Arbor, Mich. Known as type LA, the tracer measures any desired depth in holes as small as 3/4-in. Usable with any type of Profilometer, it has a tracing point that is self adjusting to the work surface.

Tracer is mechanically operated by means of a Mototrace and type BA Linkarm. By using arms of proper length for each application, measurements can be taken at various depths to 36 in. or greater with one tracer.

19. Key Duplicating Machine

A key duplicating machine capable of making keys for all door locks, padlocks, lockers and automobiles, is offered by Norwalk Lock Co., division of Segal Lock & Hardware Co. Inc., 395 Broadway, New York 13. Easy to operate, machines contain a rectifying feature which guarantees accuracy of keys made.

20. Electric Furnace

Any desired temperature between 500 and 1850°F may be selected and automatically maintained simply by moving a control knob on the model GTP electric furnace announced by Thermo Electric Mfg. Co., Dubuque, Ia. Stepless heat control is nearly 100 per cent compensating for normal fluctuations in line voltage, and is available for use on direct and alternating current of any cycle.

Inside dimensions of the furnace are 4 x

3¾x3¾-in. It is equipped with an indicating pyrometer calibrated in both fahrenheit and centigrade scales. Heating element is coiled from heavy gage alloy, and is embedded in sides, top and bottom of the heating chamber. Entire unit weighs 15½-lb.

21. Heat Exchanger

Versatile enough to be used as heaters, coolers, boilers or condensers, 7-tube Karbate impervious graphite shell and tube heat exchangers for use under highly corrosive conditions are announced by National Carbon Co. Inc., New York. They carry temperatures up to 338°F at a working pressure of 50 psi. Three standard sizes are identical except for pipe length and number of baffles.

22. Line Marker

Operating on the gravity feed principle, the Mark-Rite line marker manufactured by Universal Sales Co., Alhambra, Calif., has large wheels to facilitate operating, and an oversize filler cap to speed filling on the job. Unit requires only 5 min to set up and 5 min to clean. It has a wheel diameter of 6 in. and interchangeable paint spreader type brushes in 2, 3 or 4-in. widths.

23. Circuit Breaker

A branch circuit load center for large installations is provided by the small 4-pole multibreaker manufactured by Cutler-Hammer Inc., 320 North 12th street, Milwaukee 1. Unit may be converted to 1 or 2 double pole, 3-wire solid neutral circuits by insertion of a tie rod. Designated as MO-4, it combines thermal overload and magnetic protection as a guard against heavy short circuits. Featuring a 50 amp maximum solid main rating, it has individual single poles rated at 15, 20 or 30 amp.

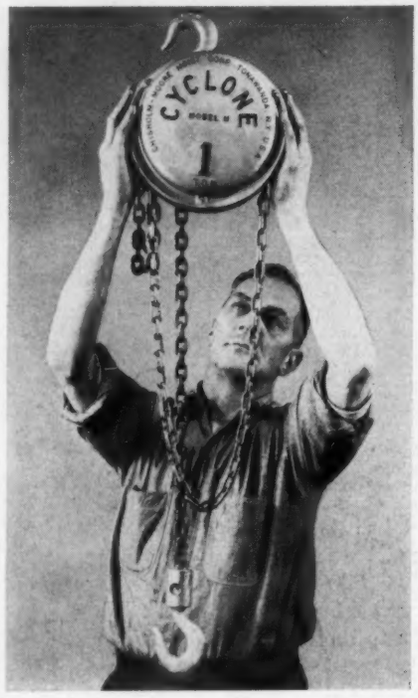
24. Automatic Stock Reel

Of automatic construction in that it unreels from either the top or bottom of a coil at a controlled rate, the automatic stock reel, made by H. E. Dickerman Mfg. Co., 321 Albany street, Springfield, Mass., has been developed for use in stamping operations. Operating power is obtained from the press. A spring loaded feeding pawl, actuated by the press through a bell crank and tie rod arrangement, engages a rack gear which is a fixed part of the reel hub.

Control of amount of unreeling is by means of two devices, one a brake, the other a pawl lifter. Mounted on a large diameter base for stability, reel is adjustable vertically to suit the height of the press. It is also adjustable to accommodate a wide range of stock coil diameters and widths.

25. Chain Hoist

Light in weight through use of steel and aluminum alloys, high speed hand operated chain hoists made by Chisholm-Moore Hoist Corp., Tonawanda, N. Y., are 96 per cent mechanically efcient. Along with savings in weight,



strength and durability are increased while excess bulk is eliminated.

All rotating parts are fitted with precision ball bearings, lifetime lubricated. Bearings and fewer parts increase lifting speed and reduce operating fatigue. Change in design reduces to a minimum the pull required to lower the load, only a light pull being required to unlock the brake and lower the load.

Known as Cyclone M, the hoist is made in four capacities ¼, ½, 1 and 2 tons.

26. Embossing Dies

Both embossing and coining are accomplished with a single set of dies made for working aluminum or magnesium alloy strips. Dies, made by Acromark Co., 398 Morrell street, Elizabeth 4, N. J., are perfectly flat to permit application of color enamel on the faces. This was accomplished by precision engraving to limited depth of female die then finishing faces of sunk engraved letters of that die to accomplish a flattening or coining result when dies were forced together. Size of dies is limited by the capacity of the press in which they are used.

27. Gathering Rack

Aluminum gathering racks used to assemble several sheets in a definite order with minimum effort are being manufactured by Evans Specialty Co. Inc., 420½ North Mulberry street, Richmond 20, Va. TU models are made in 12 and 18 sections, each section holding 500 sheets at a 45 degree angle. Six-section DU models hold 500 sheets per section in a horizontal position, enabling operation from either a sitting or standing position.

28. Wire Cutter

Application of 100 lb pressure to the drop forged handles of the carolus type cutter announced by Manco Mfg. Co., Bradley, Ill., gives a cutting power of 4 tons at the jaws. Easily carried, the tool may be used for cutting bolts, rods, wire and for nut splitting. Designed for working in hard-to-get-at places, it will cut all metals up to the hardness of case hardened steel.

29. Blueprint Coating

An improved chemical coating which deepens the blue of a blueprint and increases legibility of the paper is announced by Monsanto Chemical Co., St. Louis 4. Known as Mertone WB-2, the chemical is a silica aquasol and is used as a precoat on a paper which is subsequently coated with light, sensitive blueprint solutions. It will also minimize the graying effect caused by overexposure.

30. All Purpose Cable

Made of flexible wire rope, the Bulldozer Tenton all-purpose cable has a minimum breaking strength of 20,000 lb. A product of Wire & Cable Division of Wind Turbine Co., West Chester, Pa., it has heat treated aluminum alloy thimbles and cable connectors. Each thimble slips through the other, permitting use as a slip noose or ordinary tow cable. Comes in standard lengths of 10, 12, 15, 20, 25 and 35 ft. Cable is ½-in. 6 x 19 plow steel wire rope, galvanized against rust.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in this card. It will receive prompt attention.

Helpful Literature

50. Materials Handling

Towmotor Corp. — 36-page illustrated vest-pocket size booklet "Materials Handling Analysis Guide" presents information on improved methods of materials handling. Among topics covered are truck tie-ups, stock control problems, worker injury, breakage and suggested methods of handling materials at minimum cost.

51. Vertical Turbine Pumps

Worthington Pump & Machinery Corp.—12-page illustrated bulletin No. H-450-B33 illustrates numerous services to which vertical turbine pumps can be applied. Both open and closed draft construction types are shown.

52. Electronic Controls

Wheelco Instruments Co.—20-page illustrated booklet No. 3-6400 describes measuring and control systems; electronic control principle; and Multronic, proportioning, automatic positioning and program control instruments. Multivoltmeter, potentiometer and resistance thermometer controllers are covered also. Graphs, diagrams and photographs serve to supplement technical data.

53. Industrial Rubber Gloves

B. F. Goodrich Co.—4-page illustrated catalog section No. 9035 describes line of industrial rubber gloves and plastic treated and plastic sheet type industrial aprons. Featured is page of illustrations suggesting methods to secure maximum service from industrial gloves.

54. Hydraulic Power Units

Vickers Inc.—4-page illustrated folder No. 46-48 describes packaged hydraulic Power Pack units consisting of pump, relief valve, operating valve, oil tank and filter. Schematic diagrams show operating features and suggested applications are listed.

55. Industrial Ventilation

Ilg Electric Ventilating Co.—4-page illustrated bulletin No. 1404W describes methods of "night cooling" industrial buildings which make use of normal temperature drop of night air. Typical ventilating installations are shown and described briefly.

56. Stainless Steel

Timken Roller Bearing Co. — 8-page catalog "Timken Stainless Steel" presents sizes, finishes and types of stainless steels available for immediate shipment. Bar stock is listed in rounds, squares, hexagons and flats. Hot rolled bars, turned bars, cold drawn and centerless ground bars are listed also.

57. Overhead Conveyors

Taylor & Gaskin Inc.—12-page illustrated catalog "All-Track" describes All-Track chainless overhead conveyor system engineered for minimum space requirement, simplicity of replacement, silent operation and low power consumption. Basic features are diagrammed and specifications listed. Speeds and capacities cover wide range.

58. Sheet Metal Working

S. B. Whistler—12-page illustrated booklet is entitled "The Whistler Hydrodynamic Process for Embossing and Drawing Sheet Metal." Process which can accomplish work in single operation is especially adapted for forming shallow sweeps and shapes and drawing cone shaped and tapered stampings.

59. Air Cylinders

Miller Motor Co.—4-page illustrated folder No. A-103 presents information on universal fabricated steel air cylinders for operation on up to 200 pounds per square inch pressure. Tie rod mounting permits solid installation in minimum space. Dimensions are tabled for reference.

60. Resurfacing Material

Stonhard Co.—4-page illustrated folder "Stonhard Building Maintenance Materials for Floors, Walls, Roofs" presents wide range of resurfacing materials for almost every building maintenance need. Characteristics, application and typical uses are listed.

61. Cleaning & Finishing

Udylite Corp.—4-page folder "New Compounds for the Metal Cleaning & Finishing Industry" presents information on Anodex, Dyclene "E," Metalex "W" Special, Metex burnishing compounds, Metex soak cleaners, Rocheltex, Durodex, Solvmax, Metex acid additive and Metex pressure spray cleaners. Characteristics are given and applications listed for each.

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62. Bimetal Thermostats

Stevens Mfg. Co.—4-page illustrated folder No. F-2000 describes line of adjustable and nonadjustable bimetal thermostats with temperature range from 0 to 650 F, for 15-ampere, 115-volt, alternating current service. Applications, operating data and typical calibration curves are given.

63. Mobile Swing Boom Crane

Silent Hoist & Crane Co.—6-page illustrated bulletin No. 68 covers applications, dimensional information and specifications of Rail-O-Road Krane Kar mobile swing boom crane for use either on or off tracks.

64. Electric Hoists

Whiting Corp. — 8-page illustrated bulletin No. H-100A describes line of electric hoists. Specifications, speeds and prices are given for ¼, ½ and 1-ton hoists.

65. Drilling Machine

Sibley Machine & Foundry Corp.—4-page illustrated folder No. 66 describes 24 and 28-inch drilling machines and accessories. Rotary geared coolant pump, geared tapping attachment, feed mechanism, motor drive and top frame assembly are described in detail.

66. Heavy Duty Refractories

Norton Co.—22-page illustrated catalog No. R-1-Q presents information on line of heavy duty refractories of standard and special shapes to meet wide range of requirements in industry. Types covered include Alundum and Crystolon. Tables list properties, weights, melting points and thermal expansion data.

67. Drilling Equipment

Canedy-Otto Mfg. Co.—16-page illustrated insert No. 90 describes line of drilling equipment. Single and gang type bench, floor and radial drills with capacities from ⅜ to 1¾ inches are covered. Specifications are given for all models.

68. Air Line Respirators

Mine Safety Appliances Co.—4-page illustrated bulletin No. CS-23 describes air line respirators for use against gases and vapors, welding and cutting fumes, paint spray vapors and pigments, toxic dusts and mists and fumes from molten and burning metals.

69. Abrasive Material

Minnesota Mining & Mfg. Co.—10-page illustrated booklet No. 17.5 P.T. reveals information on typical finishing operation on aluminum die castings by using Honite abrasive pebbles. Various types and sizes of Honite and how each is best used are discussed.

70. Expanding Mandrels

K. O. Lee Co.—Illustrated data sheet presents information on Knock-Out expanding mandrels which are available in two series for diameters ranging from ⅜ to 2½ inches and from 11/16 to 5½ inches. Sets are packed in metal boxes for protection.

71. Eye Protective Devices

Mine Safety Appliances Co.—8-page illustrated catalog No. CE-29 describes complete assortment of eye protection devices for every application. Goggles, Ful-Vue spectacles, Dreadnaut goggles and welder's goggles are shown.

72. Bolt & Stud Design

National Screw & Mfg. Co.—24-page illustrated bulletin "Lok-Thred" describes line of locking bolts and studs with thread design having 60-degree thread angle with large root diameter and wide root surface which is tapered 6 degrees longitudinally to axis of thread. Bolts and studs can be assembled into holes tapped by standard drills and taps.

73. Comparator Screens

Jones & Lamson Machine Co.—28-page illustrated catalog "Screens for Optical Comparators" presents information on two types of glass screens which are available in five different sizes. Clear and frosted screens with outlines on front surface are covered and sizes listed. Overlay type screens made with mirror image are discussed.

74. V-Belt Drives

Allis-Chalmers Mfg. Co.—144-page illustrated catalog and data book covers pre-engineered stock Texrope drives for applications requiring from 1 to 150 horsepower. More than 22,000 stock drives are listed. Drives for all horsepowers, motor speeds, ratios and driven speeds are systematically listed on die-cut pages, indexed according to horsepowers.

75. Precision Limit Switches

Square D Co.—Six illustrated data sheets class 9007 describe line of small precision limit switches and machine tool limit switches. Push rod, roller arm operated and one-way roller types are included in models presented. General operating information is listed.

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Major Revision in Steel Prices Appears Unlikely

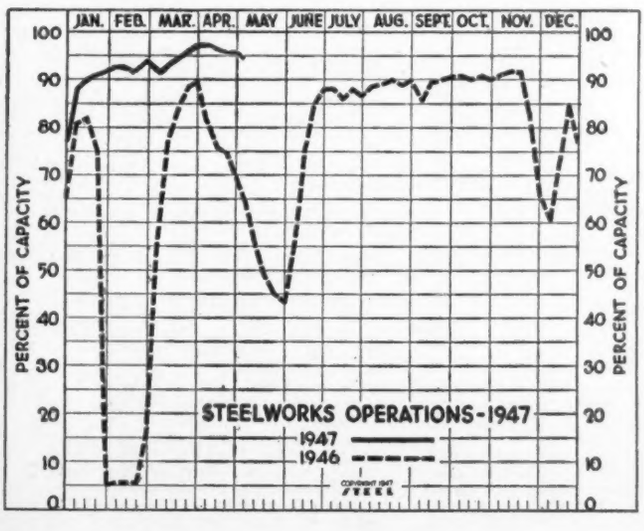
Wage boost seen precluding any substantial early reduction. Minor adjustments by individual producers indicated. Scrap still sags. Ingot rate off reflecting labor trouble

WITH the wage question pretty well out of the way, major attention now centers on likely steel industry price policy over coming months. Although steel company profits were high in first quarter, reports of 13 producers indicating an aggregate increase of about 22 per cent over fourth quarter of last year, early industry-wide reduction in base prices on steel products appears unlikely.

Expectations are the wage increase, which alone adds about $3.25 per ton in direct labor cost, coupled with expected advances in raw materials, will preclude any substantial price reduction. Nevertheless, indications last week were that individual company adjustment of price lists can be expected just as quickly as conditions permit determination of firm price policy.

Last week two small producers took action supporting this view. Keystone Steel & Wire Co., Peoria, Ill., discarded invoicing for second quarter at prices in effect at time of shipment in favor of invoicing at prices in effect at time order is placed. The former practice had been in effect since 1939. In another action, Sheffield Steel Corp., Kansas City, Mo., cut merchant bar and bar size shapes $5 per ton, passing recent production economies along to consumers.

It is difficult to determine how much significance to attach to these market developments. Whether the industry generally will return to the prewar practice of quoting firm prices for each quarter remains to be seen, while, as for the Sheffield price cut, this is an isolated instance of a producer shaving the premium it has been quoting over the general market.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended May 3	Change	Same Week 1946	Same Week 1945
Pittsburgh	101	+ 1	55.5	92
Chicago	87	— 9	66.5	98
Eastern Pa.	91	+ 0.5	71	93
Youngstown	91	+ 5	52	94
Wheeling	89	— 4.5	86	97
Cleveland	93	None	86	92.5
Buffalo	88.5	None	74.5	90.5
Birmingham	99	None	64	95
New England	95	None	85	90
Cincinnati	87	+ 2	83	90
St. Louis	68.5	—23.5	49.5	80
Detroit	92	None	87	86
Estimated national rate	94	— 1.5	64.5	95

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

Impact of the wage advances on the metalworking industry in general is yet to be determined. However, indications are metal product prices will not weaken substantially in the weeks ahead. Some reductions are possible, but so are some advances. The great majority of metalworking companies will hold prices at, or near, present levels, a spot check of opinion by STEEL indicates.

Most steel producers are beginning to accept third quarter specifications, and prospects are consumer quotas will be slightly heavier than in the current period. Steel supply, however, will continue tight. A major influence in the tight situation is the market dislocation resulting from abolition of Pittsburgh Plus pricing in 1938. Full impact on distribution of this change in marketing is only now becoming apparent.

With the opening of May, a slight show of renewed activity is reported in scrap. The market, however, continues weak and unsettled with prices off about $2.50 per ton from a week ago at $30, Pittsburgh. For the most part, buyers and sellers are marking time.

Delays in reaching agreements between the union and several important steel producing interests last week caused shutdown of some plants. The Chicago district was especialy hard hit by a strike in the plants of the Inland Steel Co. As a result, whereas a 1 point rise in the national rate had been expected, operations actually declined 1½ points to 94 per cent of capacity. At Chicago the district rate fell 9 points to 87 per cent, while it was off 23.5 points to 68.5 per cent at St. Louis, and 4.5 points at Wheeling to 89 per cent. Operations in the Youngstown district, however, were up 5 points to 91 per cent, 2 points at Cincinnati to 87 per cent, 1 point at Pittsburgh to 101 per cent, and ½ point in eastern Pennsylvania to 91 per cent. Possible coal strike July 1 when the mines are returned to private ownership is the only major threat to continued high steelmaking operations over the remainder of the year.

Further decline in scrap prices forced STEEL's composite on steelmaking grades down another 75 cents to $30.58.

COMPOSITE MARKET AVERAGES

	May 3	Apr. 26	Apr. 19	One Month Ago Apr., 1947	Three Months Ago Feb., 1947	One Year Ago May., 1946	Five Years Ago May., 1942
Finished Steel	$69.82	$69.82	$69.82	$69.82	$69.82	$63.54	$56.73
Semifinished Steel	52.10	52.10	52.10	52.10	52.10	40.60	36.00
Steelmaking Pig Iron	32.49	32.49	32.49	32.49	29.59	25.50	23.00
Steelmaking Scrap	30.58	31.33	33.92	33.94	37.25	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	May 3, 1947	Apr., 1947	Feb., 1947	May, 1946
Steel bars, Pittsburgh	2.60c	2.60c	2.60c	2.50c
Steel bars, Philadelphia	2.98	2.98	2.98	2.82
Steel bars, Chicago	2.60	2.60	2.60	2.50
Shapes, Pittsburgh	2.50	2.50	2.50	2.35
Shapes, Philadelphia	2.64	2.64	2.64	2.465
Shapes, Chicago	2.50	2.50	2.50	2.35
Plates, Pittsburgh	2.65	2.65	2.65	2.50
Plates, Philadelphia	2.85	2.85	2.85	2.55
Plates, Chicago	2.65	2.65	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.55	3.55	3.55	†4.05
Sheets, hot-rolled, Gary	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Gary	3.55	3.55	3.55	†4.05
Hot-rolled strip, Pittsburgh	2.50	2.50	2.50	2.35
Cold-rolled strip, Pittsburgh	3.20	3.20	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.425	3.425	3.425	3.05
Wire nails, Pittsburgh	4.125	4.125	4.125	3.25
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$50.00	$50.00	$50.00	$38.00
Slabs, Pittsburgh, Chicago	42.00	42.00	42.00	39.00
Rerolling billets, Pittsburgh	42.00	42.00	42.00	39.00
Wire rods 7/32 to 1/4-inch, Pitts.	2.55c	2.55c	2.55c	‡2.30c

‡ Base, No. 5 to 5/32-in.

Pig Iron

	May 3, 1947	Apr., 1947	Feb., 1947	May, 1946
Bessemer, del. Pittsburgh	$34.83	$34.83	$31.83	$27.69
Basic, Valley	33.00	33.00	30.00	26.00
Basic, eastern del. Philadelphia	35.52	35.52	32.01	27.84
No. 2 fdry., del. Pgh. N. & S. sides	34.33	34.33	31.33	27.19
No. 2 fdry., del. Philadelphia	36.02	36.02	32.51	28.34
No. 2 foundry, Chicago	33.00	33.00	30.50	26.90
Southern No. 2 Birmingham	29.88	29.28	26.88	26.94
Southern No. 2, del. Cincinnati	34.75	34.15	31.75	28.34
Malleable, Valley	33.50	33.50	30.50	26.50
Malleable, Chicago	33.50	33.50	30.50	26.90
Charcoal, low phos., fob Lyles, Tenn.	40.50	40.50	37.50	33.00
Gray forge, del. McKees Rocks, Pa.	33.66	33.66	30.66	26.55
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.19	140.00

Scrap

Heavy melting steel, No. 1, Pittsburgh	$30.00	$35.80	$33.75	$20.00
Heavy melt. steel, No. 2, E. Pa.	30.50	33.50	32.25	18.75
Heavy melt. steel, Chicago	31.25	32.75	31.25	18.75
Rails for rerolling, Chicago	36.50	38.25	38.50	22.25
No. 1 cast, Chicago	42.50	42.50	42.50	20.00

Coke

Connellsville, furnace ovens	$9.125	$9.06	$8.875	$8.15
Connellsville, foundry ovens	10.375	10.375	9.875	8.90
Chicago, by-product fdry., del.	16.10	16.10	16.10	13.75

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Canton, $52.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $42; Portsmouth Steel Corp., $55-$60, Portsmouth, O. Detroit, del., $45; eastern Mich., $46.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $50; Detroit, del., $53; eastern Mich., $54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $61; del. Detroit $64; eastern Mich., $65.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $50; Portsmouth Steel Corp., $66, Portsmouth, O.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, 7/32 to 1/4-in., inclusive $2.55-$2.80 per 100 lb. Galveston base, $2.65. Worcester, add $0.10. San Francisco (base, del.), $3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.01c; Phila., del., 2.98c, San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

Rail Steel Bars: Price, 2.60c-2.95c, same basing points as merchant carbon bars, except base is 10 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.20c; Detroit, 3.35c; Toledo, 3.40c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-2.95c.

Iron Bars: Single refined, Pittsburgh, 6.15c-†6.70c; double refined, 7.00c-†8.50c; Pittsburgh, staybolt, 7.85c-†10.00c.

† Hand puddled.

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co., quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, base, 3.55c.

Culvert Sheets, No. 16, corrugated: Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

Aluminized Sheets: No. 20 hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c. (Superior Steel Corp., 3.30c, Pittsburgh.)
Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c. (Superior Steel Corp., 4.70c, Pittsburgh.)
Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.
Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.
Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.
Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 15-16 $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del., 2.85c; St. Louis, del., 2.47c; Boston, del., 2.86c; San Francisco and Los Angeles, del., 3.29c-3.46c.
(Central Iron & Steel Co., Harrisburg, Pa., 3.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont equivalent.)
Floor Plates: Pittsburgh, Chicago, 3.90c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.
Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del.), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.
(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)
Steel Piling: Pittsburgh, Chicago, Buffalo, $3 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).
Wire to Manufacturers in carloads
Bright, basic or bessemer .....*$3.30-$3.55
Spring (except Birmingham) **$4.25
Wire Products to Trade
Nails and Staples
Standard and cement-coated.....†$3.75-$4.50
Galvanized .....‡$3.75-$4.50
Wire, Merchant Quality
Annealed (6 to 8 base) $3.95
Galvanized (6 to 8 base) $4.40
(Fob Pittsburgh, Chicago, Birmingham, per base column)
Woven fence, 15 gage and heavier .... ††84
Barbed wire, 80-rod spool ..... ††94
Barbless wire, twisted 94
Fence posts (no clamps) ..... ††90
Bale ties, single loop ..... ††86

* Worcester, $3.40, Duluth, $3.35, base. San Francisco (base, del.) $4.31 for bright basic only.
** Worcester $4.35, Duluth and Trenton, N. J., $4.50, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.
† Worcester $4.05, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
‡ Duluth $3.75, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
§ Worcester $4.05, annealed; $4.50, galvanized. Duluth $3.95, annealed; $4.40, galvanized base. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.
†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $2.85 per 100 lb; light rails (rail steel), $2.95, Williamsport, Pa.
Relaying, 60 lb and over, fob railroad and basing point, $46-$49 per net ton.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, $2.80 per 100 lb, fob mill; $3.15 base, Seattle. Splice bars, $3 per 100 lb. Standard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

Tubular Goods

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	48	23	¼	— 2	+20
¼ & ⅜	51	30½	⅜	—11½	+10
½	55½	41	1-1¼	—17	+ 2
⅝	58½	45	1½	—22½	— 1½
1-3	60½	47½	2	—23	— 2

Lap Weld

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
2	53	39½	1¼	— 1	+20
2½-3	56	42½	1½	— 7	+13
3½-6	58	44½	2	—14½	+ 5½
*8	58	42½	2½-3½	—17	+ 1½
*10	57½	42	4	—21	— 4
*12	56½	41	4½-8	—19	— 2½
			9-12	—10	+ 7

* Not T. & C.

Seamless
Steel

In.	Blk.	Gal.	In.	Blk.	Gal.
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

* Not T. & C.

Line Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	⅛	47
2½ & 3	54	¼ & ⅜	50
3½ to 8	56	½	54½
10	55½	¾	57½
12	54½	1 to 3	59½

Boiler Tubes: Net base prices per 100 feet, fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

	——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$10.89	$10.62	$10.62
1¼"	13	....	12.90	10.59	12.58
1½"	13	$12 00	14.26	11.70	13.90
1¾"	13	13.65	16.23	13.31	15.82
2"	13	15.29	18.17	15.00	17.95
2¼"	13	17.05	20.26	16.71	20.00
2½"	12	18.78	22.31	18.38	22.00
2½"	12	20.57	24.43	20.11	24.07
2¾"	12	21.80	25.89	21.27	25.46
3"	12	22.87	27.18	22.26	26.68
3¼"	11	26.88	31.94	26.15	31.33
3½"	11	28.86	34.30	28.06	33.64
4"	10	35.82	42.55	34.78	41.68
4½"	9	47.48	56.42	....	....
5"	9	54.96	65.30	....	....
6"	7	84.38	100.25	....	....

Pipe, Cast Iron: Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length ..... 55 off
⅝ and ¾, up to 6 in. in length..... 52 off
¾ x 6 in. ..... 49 off
⅞ and 1 in. x 6 in. length..... 51 off
1⅛ in. and larger in all lengths and 6 in. and larger in lengths over 6 in. .. 48 off
½ in. and smaller, longer than 6 in. ... 45 off
Tire bolts .....38½ off
Step bolts ..... 46 off
Plow bolts ..... 57 off

Stove Bolts

In packages, nuts separate, 60-10 off; bulk 74 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon	51 off	.....
⅞-in. and smaller.....	.....	48 off
½-in.-1-in.	48 off	.....
1 1/16-in.-1-in.	.....	47 off
1⅛-in.-1½-in.	46 off	45 off
1⅝-in. and larger	.....	44 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

Upset 1-in., smaller (10-20 bright)..... 56 off
Upset (10-35 heat treated)
⅝ x 6 ..... 51 off
¾, ⅞, & 1 x 6..... 47 off

Square Head Set Screws

Upset 1-in. and smaller ..... 61 off
Headless, ¼-in. and larger..... 46 off
No. 10 and smaller..... 56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural 5.25c
Lebanon, Pa. 5.40c
⅞-in. and under..... 55-5 off
Lebanon, Pa. .....55-5 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl .....$1.50-$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per bbl; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	74.00c
1.5	4	1	8.5	59.00c
12	3	0.50	.	62.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430 ...	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

Pig Iron

Prices per gross ton

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$34.50	$34.00	$35.50	$35.00
Newark, N. J., del.	36.34	35.84	37.34	36.84
Brooklyn, N. Y., del.	37.50	....	....	38.00
Birdsboro, Pa., base	34.50	34.00	35.50	35.00
Philadelphia, del.	36.02	35.52	37.02	36.52
Birmingham, base	29.88	29.38	34.50	....
Baltimore, del.	36.28	....	....	....
Chicago, del.	34.12	....	....	....
Cincinnati, del.	34.75	34.25	....	....
Newark, N. J., del.	35.96	....	....	....
Philadelphia, del.	35.13	....	....	....
St. Louis, del.	33.87	33.37	....	....
Buffalo, base	33.00	32.50	34.00	33.50
Boston, del.	39.48	38.98	40.48	39.98
Rochester, del.	34.84	34.34	35.84	35.34
Syracuse, del.	35.50	35.00	36.50	36.00
Chicago, base	33.00	32.50	34.00	33.50
Milwaukee, del.	34.32	33.82	35.32	34.83
Muskegon, Mich., del.	36.83	....	....	37.33
Cleveland, fob furnace	33.00	32.50	34.00	33.50
Akron, del.	35.17	34.17	35.67	35.17
Duluth, base	33.50	33.00	34.50	34.00
Erie, Pa., base	33.00	32.50	34.00	33.50
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.00	29.50	31.00	30.50
Granite City, Ill., base	33.50	33.00	....	33.50
St. Louis, del.	34.25	33.75	....	34.25
†**Neville Island, Pa., base**	33.50	33.00	34.00	33.50
Pittsburgh, del., N. & S. Sides	34.33	33.83	34.83	34.33
Provo, Utah, base	33.50	33.00	....	....
Seattle, Tacoma, Wash., del.	38.60	....	....	....
Portland, Oreg., del.	38.60	....	....	....
Sharpsville, Pa., base	33.50	33.00	34.00	33.50
Steelton, Pa., base	34.50	34.00	35.50	35.00
Swedeland, Pa., base	35.50	....	36.50	36.00
Troy, N. Y., base	34.50	34.00	35.50	35.00
Toledo, O., base	33.00	32.50	34.00	33.50
Cincinnati, del.	36.50	36.00	....	....
Youngstown, O., base	33.50	33.00	34.00	33.50
Mansfield, O., del.	36.48	35.98	36.98	36.48

† To Neville Island base add: 66c for McKees Rocks, Pa.; $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of Sharpsville, Pa., basing point price for No. 2 foundry, basic, bessemer and malleable pig iron.

High Silicon Silvery

6.00-6.50 per cent (base).....$40.50
6.51-7.00..$41.50 9.01- 9.50. 46.50
7.01-7.50.. 42.50 9.51-10.00. 47.50
7.51-8.00.. 43.50 10.01-10.50. 48.50
8.01-8.50.. 44.50 10.51-11.00. 49.50
8.51-9.00.. 45.50 11.01-11.50. 50.50

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, $52.75, Jackson, O.; $56 Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.... $40.50 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $33.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., Birdsboro, Pa., $39, base; Philadelphia, $41.16, del. Intermediate phosphorus, Central furnace, Cleveland, $36.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace..	*$8.75–$9.50
Connellsville, foundry.	9.75–11.00
New River, foundry...	12.50
Wise county, foundry.	11.15
Wise county, furnace..	10.65

* Operators of hand-drawn ovens using trucked coal, $9.35-$10.10.

By-Product Foundry

Kearney, N. J., ovens.	$15.35
Chicago, outside del...	15.10
Chicago, del.	16.10
Terre Haute, del.	15.60
Milwaukee, ovens	15.85
New England, del.	17.25
Birmingham, del.	12.35
Indianapolis, ovens ...	14.50
Cincinnati, del.	15.35
Ironton, O., ovens....	13.35
Painesville, ovens	14.60
Cleveland, del.	15.90
Buffalo, del.	16.10
Detroit, del.	15.75
Philadelphia, ovens ...	14.50
Portsmouth, O., ovens.	14.00
Fairmount, W. Va., ovens	13.75
Pittsburgh, del.	15.61

Coke By-Products

Spot, gal, freight allowed east of Omaha

Pure and 90% benzol.....	17.00c
Toluol, two degrees.....	22.00c
Industrial xylol	22.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots.....	12.00c
Do., tank cars.....	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia.....	$30.00

Refractories

Per 1000, fob shipping point Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	76.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low Heat Duty

Pa., Md., Ohio.....	56.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago.....	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite....	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer.....	$5.95
Old range nonbessemer.....	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

N. African low phos.....	Nom.
Swedish basic, 60 to 68%.	13.00
Spanish, No. African basic, 50 to 60%.....	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro.....	7.50–8.00

Tungsten Ore

Wolframite, per short ton unit, duty paid	$24–$25

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio .....$27-$27.50	
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio.....$27-27.50	
48% no ratio	30.00
48% 3:1 lump.....	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	3.85	3.75–3.85	...	...	...
Cold-Rolled	4.55–4.75	4.55–4.75	4.55–4.75	4.75	...	4.55–4.75	...	...	...
Galvanized	5.40	.....	.....	...	...	.....	...	...	...
Strip, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	...	.....	...	...	...
Cold-Rolled	4.55	4.65	4.65	4.65	...	.....	...	...	...
Shapes, Structural	3.85	3.85	.....	3.85	....	.....	3.85	...	...
Plates	4.10	4.10	4.10	...	4.10	.....	...	...	...
Bars and Bar Shapes..	4.00	4.00	4.00	4.00	...	4.00	...	4.00	4.00

Note: Lower level of quoted ranges represent prices for NAX High Tensile, produced by Great Lakes Steel Corp., Detroit.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS					STRIP		BARS			PLATES		
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	C-R	H-R	C-F	H-R Alloy (§4140)	Structural Shapes	Carbon ¾"-¾"	Floor ¾" & Thicker
Boston (city)	4.50	....	5.22[4]	5.55[4]	6.80[4]	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
††New York (city)	4.42	....	5.27[8]	5.47[8]	....	4.62	....	4.62	5.17	8.42[13]	4.37	4.72	6.35
New York (country)	4.32	....	5.17[8]	5.37[8]	....	4.52	....	4.52	....	....	4.27	....	6.25
Philadelphia (city)	4.24	5.73[8]	5.33[8]	5.29[8]	6.54[8]	4.43	5.28	4.48	5.38	6.87	4.22	4.44	5.93
Philadelphia (country)	4.14	5.63[8]	5.23[8]	5.19[8]	6.44[8]	4.33	5.18	4.38	....	6.60	4.12	4.34	5.83
Baltimore (city)	4.09	6.15[8]	5.65[8]	5.14[8]	6.39[8]	4.40	....	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.59	6.05[8]	5.55[8]	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18[8]	6.43[8]	4.65	....	4.70	5.60[13]	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Buffalo (city)	4.05	....	4.75[8]	5.35[8]	....	4.30	5.25	4.10	4.75	....	4.10	4.65	5.90
Buffalo (country)	3.90	....	4.60[8]	4.95[8]	....	3.90	4.85	3.95	4.60	6.60	3.95	4.20	5.45
Pittsburgh (city)	4.05	5.20[8]	4.75[8]	5.10[8]	6.35[8]	4.05	5.00	4.10	4.75	6.60	4.10	4.30	5.60
Pittsburgh (country)	3.90	5.05[8]	4.60[8]	4.95[8]	6.20[8]	3.90	4.85	3.95	4.60	6.60	3.95	4.15	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.138	....	4.218	4.488	5.178
Youngstown, O. (country)	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.15	5.30	4.85	5.42	6.67	4.34	5.24	4.20	4.87[13]	7.01	4.42	4.49	5.92
Cleveland (city)	4.05	5.20[8]	4.75[8]	5.238[8]	6.488[8]	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	3.90	5.05[8]	4.60[8]	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.116	5.266[8]	....	5.166[8]	....	4.394	....	4.403	5.303	....	4.444	4.453	5.944
Chicago (city)	4.05	5.20[8]	4.75[8]	5.10[8]	6.35[8]	4.05	5.10	4.10	4.75	6.60[13]	4.10	4.25	5.75
Chicago (country)	3.90	5.05[8]	4.60[8]	4.95[8]	6.20[8]	3.90	4.95	3.95	4.60	6.60[13]	3.95	4.10	5.60
Milwaukee	4.249	5.399[8]	4.949[8]	5.299[8]	6.549[8]	4.249	5.299	4.299	4.949	6.899	4.299	4.449	5.949
St. Paul	4.384[1]	5.534[8]	5.084[8]	5.434[8]	6.684[8]	4.404[13]	....	4.434[13]	5.726[11]	7.084[11]	4.434[13]	4.684[13]	6.084[13]
Indianapolis	4.04	....	4.84[8]	5.29[8]	6.54[8]	4.24	....	4.36‡‡	5.26	....	4.36	4.61	6.01
St. Louis	4.199	....	4.899[9]	....	6.674[8]	4.199	....	4.249	5.324[13]	7.074	3.999	3.999	5.999
Birmingham (city)	3.85[30]	....	....	5.20[8]	....	4.10[30]	....	4.05[30]	5.83	....	4.05	4.30	6.56
Birmingham (country)	3.75[30]	....	....	5.20[8]	....	4.00[30]	....	3.95[30]	....	....	3.95	4.20	....
New Orleans	4.46[30]***	....	5.77[8]	....	....	4.83[30]	....	4.78[30]***	5.94[11]	....	4.68[30]***	5.03[30]	6.94[30]
Houston, Tex.	5.00[1]	....	....	6.00	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.868	6.118[8]	....	5.918[8]	7.168[8]	4.862	....	4.918	5.818[13]	....	4.918	5.068	6.568
Los Angeles	5.55	....	7.10[8]	....	8.10[8]	5.65	8.35	5.10	6.90[19]	7.85	5.20	5.10	7.20
San Francisco	4.90§§	....	6.30[8]	....	7.35[8]	5.20[16]	8.35[16]	4.75[16]	•••	9.35[16]	4.90[16]	5.00[16]	6.80[16]
Tacoma, Wash.	....	....	....	7.30[8]	....	5.30[17]	....	5.00[17]	6.75[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]
Seattle	5.00[17]	....	....	7.30[8]	....	5.30[17]	....	5.00[17]	6.75[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 19999 pounds; [19]—1500 to 39,999; [30]—400 to 3999 pounds.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ basing point cities with quotations representing mill prices plus warehouse spread; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; ** add 0.46 for sizes not rolled in Birmingham; †† sameprices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; *** rounds under ⅜ in. 7.00c, ⅜ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44; Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie - Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $2.10; contract, $2.08; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

Ferrochrome: Contract, lump packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlof packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots. **S. M. Ferrochrome, high carbon:** (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched, 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb to c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l. 14.10c; 2000 lb to c.l. 15.60c; central 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about ⅛ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2½ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max, Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CMSZ Alloys 4 & 5 (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern, freight allowed; 14.80c, 15.65c, 17.10c, 17.85c, central; 14.80, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Zr 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 98.8%, $2.80, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% Na_2O; or air dried, 83-85% V_2O_5 and 5.15% Na_2O, $1.10 per lb contained V_2O_5 fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Nonferrous Metal Prices Hold Steady

Major metals hold firm as silver declines . . . Overall supply outlook brightens

NEW YORK — An expected advance in copper prices probably will develop from sales of foreign metal to domestic consumers, following the signing last week of the bill which suspends the import tax on copper until Mar. 31, 1949. Producers of domestic copper are reluctant to advance but foreign sales likely will be the determining factor in the price trend as a dual price structure is not desirable.

Another important governmental action was the revocation of general imports order M-63, effective May 1, and transfer of controls over tin imports from the Office of Temporary Controls to the Civilian Production Administration's tin conservation order M-43.

The only major price change last week in nonferrous metals was a drop in silver prices, others holding unchanged.

COPPER — Suspension of the import duty has not increased supply to any great extent as yet, but metal previously bought and held in bonded warehouse now will probably be withdrawn without payment of the duty. Some sales resistance already has been noted at the present 21.50-cent level and opinion is divided as to maintenance of the price level now obtaining for foreign metal, or around the equivalent of 24.00c, delivered Connecticut valley.

Some cancellations are developing in brass mill products and new orders are slower. Duplicate orders placed earlier for protection against shortages is given as a reason for some deferments. A leading Bridgeport, Conn., fabricator of brass mill products is reducing inventories. Wire and cable producers are experiencing no decline in orders and few cancellations.

LEAD — Production of refined lead in the United States increased sharply in March to 51,239 tons from 44,053 tons in February and established a new three year high, according to the American Bureau of Metal Statistics. Total output in the first quarter amounted to 140,921 tons compared with 118,033 tons in the like 1946 period when operations were interrupted by strikes. Shipments to domestic users in March, totaling 52,465 tons, also were the largest since March, 1944, and were 2827 tons above the February total. First quarter shipments amounted to 146,991 tons against 121,765 tons in the like 1946 period. Stocks of refined lead at refineries at the end of March aggregated 41,990 tons compared with 43,233 tons at the end of February. Government stocks of refined lead, part of which is included in stocks at refineries, total only 28,549 tons as of Mar. 1 compared with 36,124 tons at the beginning of the year and 68,700 tons as of Jan. 1, 1946.

Prices held unchanged at 14.80c to 14.85c, East St. Louis, for common grade.

ZINC — Consensus of members attending the annual meeting of the American Zinc Institute last week in St. Louis is that steady progress is being made toward balancing supply and demand (see p. 72 for additional details of the meeting.) Supply of individual grades, especially prime western and special high grade, will continue to remain a problem, according to a government official. Consumption of slab zinc in 1947 and 1948 is estimated at 879,000 and 889,000 short tons, respectively, as compared with the preliminary 1946 figure of 790,404 tons. The average 1935-1939 consumption was 542,400 tons. Domestic production is estimated at 800,000 per year in 1947 and 1948 compared with 773,300 tons in 1946.

Trading in the market was quiet last week with prices unchanged on basis of 10.50c East St. Louis, for prime western.

TIN — Tin was the last commodity to remain under provisions of the general imports order M-63, now revoked and which at one time controlled importation of more than 500 commodities. Inventory restrictions under amended order M-43 permit 90 days' supply of pig tin for tin plate manufacture and 45 days' supply for any other permitted use, except 30 days' supply for solder, babbitt and other alloys containing 1.5 per cent or more tin, excepting copper-base alloys which are allowed 45 days'.

Order M-43, as amended, also prohibits unauthorized diversion to domestic use of intransit shipments of tin originally consigned to foreign countries and it clarifies the delivery certification requirements for export purchases.

Pig tin prices held last week at 80.00c, New York.

SILVER — Handy & Harman reduced its "official" silver price to 73.75 an ounce last week, compared with 75.62½c which held from Apr. 18 to Apr. 29. Weakness in the foreign market was attributed to an accumulation of unsold foreign metal. Buyers have not been absorbing the normal available supply from foreign producers which has been averaging about 250,000 ounces daily.

PLATINUM—The domestic platinum market was strengthened last week by reports of a firmer undertone in London where an improved demand for the metal in the United Kingdom and in continental Europe was reported. Another leading platinum firm in London raised its quotation to the level of $63 to $66 which was established by important sellers on Apr. 14.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, del. Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 21.25c, refinery, 20,000 lb or more; 21.50c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 20.50c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 24.50c; No. 1 yellow (No. 405) 16.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 15.00c-15.25c; No. 12 foundry alloy (No. 2 grade) 14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.50c; grade 2 (92-95%) 14.50c; grade 3 (90-92%) 13.75c; grade 4 (85-90%) 13.25c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlot; 22.50c 100 lb to c.l. Extruded 12-in. sticks 34.00c-38.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c, 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $85-$88 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.50 lb for 550 lb (keg); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 73.75c per ounce.

Platinum: $62-$66 per ounce.

Palladium: $24 per troy ounce.

Iridium: $85-$95 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 32.93c; yellow brass 28.88c; commercial bronze, 95% 32.97c, 90% 32.36c red brass, 85% 31.24c, 80% 30.63c; best quality 29.89c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 37.71c; nickel silver, 18%, 41.54c; phosphor bronze, grade A, 5%, 50.75c.

Rods: Copper, hot rolled 29.28c, cold drawn 30.28c; yellow brass, free cutting, 23.64c, not free cutting 28.57c; commercial bronze, 95% 32.66c, 90% 32.05c; red brass, 85% 30.93c, 80% 30.32c; best quality 29.58c.

Seamless Tubing: Copper 32.97c; yellow brass 31.64c; commercial bronze 90% 34.77c; red brass 85% 33.90c, 80% 33.29c; best quality brass 32.30c.

Copper Wire: Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weatherproof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 31.13c, 15,000 lb or more 31.38c, less carlots 31.88c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles.
Pipe: Full coils 17.50c; cut coils 17.75c.
Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electro-deposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz balls, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c, 500 to 1000 lb, 95.25c, 200 to 500 lb, 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 9999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.00c, No. 2 copper 17.00, light copper 16.00, composition red brass 15.75, auto radiators 12.25, heavy yellow brass 11.25, brass pipe 11.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper, 19.50-19.75; No. 2 copper, 18.50-18.75, light copper, 17.25-17.50; refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 17.62½c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 16.50-17.00; No. 2 15.50-16.00; light copper 14.25-14.75; No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.50-9.00, new brass clippings 12.50-13.00, No. 1 brass rod turnings 13.00-13.50, light brass 7.25-7.75, heavy yellow brass 8.50-9.00, new brass rod ends 13.50-13.75, auto radiators, unsweated 10.00-10.50, clean red car boxes 12.00-12.50, cocks and faucets 10.50-11.00, brass pipe 9.75-10.25.

Lead: Heavy lead 12.50, battery plates 7.50-7.75, linotype and stereotype 12.75-13.25, electrotype 10.75-11.25, mixed babbitt 13.50-14.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.50-6.00, new die cast scrap 4.50-5.00, old die cast scrap 3.50-4.00.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 8.50-9.00, old sheets 7.00-7.25, crankcase 7.00-7.25, borings and turnings 2.00, pistons, free of struts, 5.50-6.00.

Nickel: Anodes 19.50-20.50, turnings 16.50-17.50, rod ends 19.00-20.00.

Monel: Clippings 14.00-15.00, turnings 9.00, old sheet 12.00-13.00, rods 12.50-13.00, castings 10.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	30.00
Nos. 1, 2 & 3 Bundles	30.00
Machine Shop Turnings	27.00-27.50
Mixed Borings, Turnings	27.00-27.50
Short Shovel Turnings	29.00-29.50
Cast Iron Borings	28.00-28.50
Bar Crops and Plate	37.00-37.50
Low Phos. Cast Steel	37.00-37.50
Punchings & Plate Scrap	37.00-37.50
Elec. Furnace Bundles	37.00-37.50
Heavy Turnings	31.00-31.50
Alloy Free Turnings	29.50-30.00
Cut Structurals	39.00-40.00
No. 1 Chemical Borings	31.00-32.00

Cast Iron Grades

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	33.00-34.00
Stove Plate	37.50-38.00
Unstripped Motor Blocks	37.50-38.00
Malleable	45.50-46.00
Brake Shoes	35.00-36.00
Clean Auto Cast	41.50-42.50
No. 1 Wheels	42.00-42.50
Burnt Cast	35.00-36.00

Railroad Scrap†

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00-46.00
Axles	43.00-44.00
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	42.00-43.00
Rails, 18 in. and under	43.50-44.00
Railroad Specialties	42.00-43.00
Uncut Tires	39.00-41.00
Angles, Splice Bars	41.00-42.00

† Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	$30.50-31.00
No. 2 Heavy Melt. Steel	30.50-31.00
No. 1 Busheling	30.50-31.00
Nos. 1 & 2 Bundles	30.50-31.00
Machine Shop Turnings	25.50-26.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	33.50-34.50
Cast Steel	33.50-34.50
Punchings & Plate Scrap	33.50-34.50
Elec. Furnace Bundles	31.50-32.00
Heavy Turnings	30.00-30.50
Alloy Free Turnings	29.50-30.00
Cut Structurals	37.50-38.00

Cast Iron Grades

No. 1 Cupola	43.00-45.00
Charging Box Cast	38.00
Stove Plate	38.00
Heavy Breakable Cast.	38.00
Unstripped Motor Blocks	40.00
Malleable	55.00-57.00
Brake Shoes	42.00
Clean Auto Cast	45.00
No. 1 Wheels	42.00
Burnt Cast	40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-32.50
R.R. Malleable	55.00-57.00
Rails, Rerolling	40.00-41.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	42.00
Railroad Specialties	42.00
Uncut Tires	41.00
Angles, Splice Bars	42.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	31.00-31.50
No. 1 Bundles	31.00-31.50
Machine Shop Turnings	26.00-27.00
Short Shovel Turnings	28.00-29.50
Cast Iron Borings	28.50-29.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-32.50

MANSFIELD

No. 1 Heavy Melt. Steel	$31.00-31.50
Machine Shop Turnings	26.00
Short Shovel Turnings	28.00

CINCINNATI

No. 1 Heavy Melt. Steel	$29.00
No. 2 Heavy Melt. Steel	29.00
No. 1 Busheling	29.00
No. 1 Bundles	29.00
No. 2 Bundles	29.00
Machine Shop Turnings	22.00
Mixed Borings, Turnings	20.00
Short Shovel Turnings	23.00
Cast Iron Borings	23.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	31.00
Heavy Breakable Cast.	33.00
Stove Plate	29.00
Unstripped Motor Blocks	32.00
Brake Shoes	28.00
Clean Auto Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	42.00
Rails, Rerolling	35.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	42.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$29.50-30.00
No. 1 Busheling	29.50-30.00
Nos. 1 & 2 Bundles	29.50-30.00
No. 3 Bundles	29.50-30.00
Machine Shop Turnings	23.50-24.00
Mixed Borings, Turnings	23.50-24.00
Short Shovel Turnings	24.50-25.00
Cast Iron Borings	24.50-25.00
Punchings & Plate Scrap	34.00-34.50

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Heavy Breakable Cast.	28.00-29.00
Clean Auto Cast	36.00-38.00

BUFFALO

No. 1 Heavy Melt. Steel	$29.00-31.00
No. 2 Heavy Melt. Steel	29.00-31.00
No. 1 Busheling	29.00-31.00
Nos. 1 & 2 Bundles	29.00-31.00
Machine Shop Turnings	22.00-22.50
Mixed Borings, Turnings	22.00-22.50
Cast Iron Borings	22.00-22.50
Short Shovel Turnings	24.00-24.50
Punchings & Plate Scrap	32.00-34.00
Elec. Furnace Bundles	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-40.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast.	34.00-35.00
Stove Plate	33.00-35.00
Malleable	40.00-41.00
Clean Auto Cast	38.00-39.00
No. 1 Wheels	38.00-39.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$30.00-31.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
No. 1 Bundles	30.00-31.00
No. 2 Bundles	27.00-28.00
No. 3 Bundles	25.00-26.00
Machine Shop Turnings	23.00-24.00
Mixed Borings, Turnings	21.00-22.00
Short Shovel Turnings	24.00-24.50
Bar Crops and Plate	34.00
Punchings & Plate Scrap	34.00
Cut Structurals	33.00-34.00
Elec. Furnace Bundles	31.00-32.00
Heavy Turnings	30.00-31.00
No. 1 Chemical Borings	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	45.00-46.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast.	38.00-39.00
Unstripped Motor Blocks	40.00
Malleable	48.00-49.00
Clean Auto Cast	45.00-46.00
No. 1 Wheels	44.00-45.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	25.00
No. 1 Busheling	23.00-25.00
Nos. 1 & 2 Bundles	25.00
No. 3 Bundles	23.00-25.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings	20.00-21.00
Punchings & Plate Scrap	27.00-28.00
Elec. Furnace Bundles	26.00
Cut Structurals	27.00-28.00
No. 1 Chemical Borings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Charging Box Cast	38.00-40.00
Unstripped Motor Blocks	35.00-36.00
Malleable	48.00-49.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$23.00-23.50
No. 2 Heavy Melt. Steel	23.00-23.50
Nos. 1 & 2 Bundles	23.00-23.50
No. 1 Busheling	21.00-21.50
Machine Shop Turnings	17.00-17.50
Mixed Borings, Turnings	16.00-17.00
Short Shovel Turnings	18.00-19.00
Bar Crops and Plate	27.00-28.00
Punchings & Plate Scrap	27.00-28.00
Chemical Borings	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-40.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	35.00
Unstripped Motor Blocks	33.50-34.50
Clean Auto Cast	40.00-41.00

CHICAGO

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	31.00-31.50
Nos. 1 & 2 Bundles	31.00-31.50
No. 3 Bundles	29.00-29.50
Machine Shop Turnings	25.50-26.50
Mixed Borings, Turnings	25.50-26.50
Short Shovel Turnings	27.50-28.50
Cast Iron Borings	26.50-27.50
Bar Crops and Plate	33.50-34.00
Cast Steel	33.50-34.00
Punchings	33.50-34.00
Elec. Furnace Bundles	32.00-32.50
Heavy Turnings	30.50-31.00
Cut Structurals	33.00-33.50

Railroad Scrap

No. 1 Cupola Cast	40.00-45.00
Malleable	40.00-45.00
Clean Auto Cast	40.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-32.50
Rails, Rerolling	36.00-37.00
Rails, Random Lengths	35.00-36.00
Rails, 3 ft. and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	37.00-38.00
Angles, Splice Bars	37.00-38.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$31.50-32.50
No. 2 Heavy Melt. Steel	31.50-32.50
Machine Shop Turnings	26.50-27.50
Short Shovel Turnings	28.50-29.50

Cast Iron Grades
(Fob shipping point)

No. 1 Cupola Cast	40.00-42.00
Charging Box Cast	35.00-36.00
Heavy Breakable Cast.	30.00-33.00
Stove Plate	34.00-36.00
Brake Shoes	33.00-35.00
Clean Auto Cast	40.00-42.00
No. 1 Wheels	34.00-36.00
Burnt Cast	30.00-33.00

Railroad Scrap

R.R. Malleable	40.00-45.00
Rails, Rerolling	36.00-38.00
Rails, Random Lengths	34.00-36.00
Rails, 3 ft and under	38.00-40.00
Uncut Tires	34.00-36.00
Angles, Splice Bars	35.00-37.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
Nos. 1 & 2 Bundles	29.00-30.00
Long Turnings	23.00
Short Shovel Turnings	25.00
Cast Iron Borings	24.00
Bar Crops and Plate	32.00-33.00
Punchings & Plate Scrap	36.00-37.00
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-39.00
Stove Plate	35.00-36.00
No. 1 Wheels	32.00-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.50-30.00
R.R. Malleable	37.50-38.00
Axles, Steel	33.00
Rails, Rerolling	36.00-37.00
Rails, Random Length.	30.00-31.00
Rails, 3 ft and under	32.00-33.00
Angles and Splice Bars.	32.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$19.04
No. 2 Heavy Melt. Steel	*19.04
No. 1 Busheling	*19.04
Nos. 1 & 2 Bundles	*19.04
No. 3 Bundles	*17.04
Machine Shop Turnings	*12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structurals	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths	21.00
Uncut Tires	28.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structurals	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles	27.00

Cast Iron Grades

No. 1 Cupola Cast	30.00

Sheets, Strip . . .

Increased allotments or wider distribution seen if output remains high

Sheet Prices, Page 160

Boston — If production holds at present levels through June, inroads on backlogs will make possible slightly heavier quotas or broader distribution of some flat-rolled products in the third quarter. Mills are now lining up next quarter schedules. While any increase in tonnage will be slight, notably in hot-rolled and pickled carbon stock, scattered cancellations, deferments and revised estimated requirements will have some effect, although housing and car-building tonnages will account for a sizable slice. Price variances in narrow cold-rolled strip, due to different interpretations of extras, has brought some pressure by larger consumers buying from several suppliers for tonnage at the lowest level.

New York — Sheet sellers are beginning to set up quotas for third quarter. Arrearages in some cases will not be quite as heavy as at the end of last quarter—at least that is what some producers are counting on, but there is question as to whether the general run of customers will receive any more tonnage than in the current quarter for the reason that there will be continued allocations for the housing and the railroad car programs.

Philadelphia — Most sheet consumers should know within the next few days what to expect in the way of third quarter quotas. Some producers have already advised carbuilders and manufacturers of equipment for the housing program what they can expect for next quarter and have been accepting specifications.

Some orders carrying "MM" ratings have been received here from casket makers for third and fourth quarter. The orders are held as endorseable because the caskets are to be used to return dead militia from abroad.

Cleveland — All sheet and strip sellers in this district continue to sell on the basis of "price on date of shipment." Some interests have reduced quotas in an effort to reduce the order backlogs. Those selling on a quarterly basis are expected to open third quarter books later this week while those selling on a monthly basis are filling July orders and will open August books soon. No cancellations of consequence have been noted, but consumers of flat-rolled products note smaller consumption and are watching their inventory position carefully.

Cincinnati—Pressure for deliveries from sheet mills is sustained, with no indication of easing in demand because of resistance at consumer levels. Mills are holding to quarterly schedules, and have not yet accepted tonnages for the third quarter when shifts in needs, if any, should appear. Stainless steel sheets are available promptly on order.

Chicago — While sheet and stripmakers are cognizant that many of their customers are being forced to curtail production because their products are not moving freely, they claim the situation has not yet been reflected in cancellations. Manufacturers still accept all of the tonnage allocated to them and press for more. Apparently, sheet and strip are two items badly needed to balance inventories of steel to complete goods in process. One automobile truck maker has reduced schedules because of shortage of hot rolled strip needed for frames. One local sheet and strip mill is making up its quotas this week preparatory to assigning customer quotas for last half. Some reduction is indicated.

Birmingham—Easing in pressure for prompt deliveries of sheets is not anticipated until late this year at the earliest, and then only if cold reduction facilities of Tennessee Coal, Iron & Railroad Co. are in production. Some observers do not believe even the new capacity will materially ease the situation for long, since several sheet processors are interested in the district contingent upon availability of raw materials. Inventories generally are at a low level in comparison with high production rates.

Sheffield Steel Corp. Cuts Merchant Bar Prices $5

Kansas City, Mo. — Effective as of Apr. 28, Sheffield Steel Corp., this city, reduced prices $5 a ton on merchant bars and bar size shapes. This removes a part of the premium under which the company has been operating and which had been necessary due "to highly inflated scrap and production costs." The reduction is the result of some economies which the company has been able to effect recently in production costs.

Steel Bars . . .

Bar Prices, Page 160

Pittsburgh — No let-up in delivery pressure for merchant bars in smaller size ranges is indicated until late this year at earliest. The augmented freight car construction program has accentuated the tight supply outlook, while increasing requirements are developing from automotive parts suppliers. Some easing in demand for 4, 5 and 6-inch rounds from forgers, machine tool builders and jobbing trade is noted, however, with some producers offering tonnage on two months delivery basis. Output of cold-finished bars has improved recently reflecting better balanced inventories. Demand outlook is unchanged although an occasional shipping deferment is reported. Many consumers are more closely watching inventory position. Producers continue to make headway against alloy bar order backlogs, with supply situation currently in good balance with demand.

New York — Hot carbon bar sellers have begun to set up quotas for third quarter and, with the exception of the small specifications, supply likely will be a shade better than for the current quarter, notwithstanding the fact that more will be voluntarily allocated the car builders than at present.

Sellers have been accepting specifications for cold-drawn carbon bars for third quarter for some time past and in some cases are even now accepting business for fourth quarter. The situation in alloy bars, both hot-rolled and cold-drawn, continues easy, with shipments available within four to six weeks.

Boston — Hot-rolled carbon bar tonnage will be allocated for third quarter with indications increases in quotas will be rare, probably none in the smaller sizes. Some consumers are still short of bars, but the overall situation has eased slightly due to improved supply of alloys, most specialties and more sizes of cold finished. Consumption of these grades is relatively high in this area and a few industries have lower requirements, the machine tool for one. Forge shops, while buying more conservatively, are still in want of some carbon bar sizes —and grades.

Cleveland — Some softening in alloy, cold-finished carbon and large sizes of hot-rolled carbon bars is noted, but the balance of bar products is as tight as ever. Consumers are still pressing for larger shipments of small rounds, angles, squares and other bar shapes. Third quarter books are expected to be opened in another week following a review of housing and railroad requirements.

Wire . . .

Wire Prices, Page 161

Boston — Wire mill backlogs include a high ratio of high carbon specialties and pressure for deliveries holds. New buying is active. The small number of cancellations and deferments is so varied as to products definite reasons are difficult to trace; earlier duplication of orders is cropping out in spots. Consumer inventories are not considered generally large, although unbalanced in individual cases. There are few soft spots in mill schedules, including rope wire, alloys and welding wire. Rods continue scarce and supply of semifinished subjects nonintegrated mill schedules to frequent revision. While there are scattered deferments on flat wire, the clock industry has again increased requirements and automotive needs, including valve spring wire, are heavy.

Chicago — With exception of wire rope, all wire and wire product items are tight and demand exceeds production capacity. In manufacturers wire, there are evidences that consumer resistance is forcing cutbacks in some items such as bedding, but so far this is not being reflected at mill level. All merchant lines are exceedingly tight, including fencing, barbed wire, posts and nails. Some jobbers are refusing their quotas of light fencing, because customers are demanding the heavier gage fencing, of which there is not enough available.

Birmingham—Wire demand has eased somewhat recently. Observers see nothing more, however, than an indication of the futility of continued pressure with the result that no permanent improvement is yet recorded. Practically all processors are short in drawn wire inventories. Wire fencing and nails supplies are short, especially for the needs of agricultural interests, demand from which will increase with the advent of mild weather.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 161

Pittsburgh — Shortage of small wire sizes continues to retard production of fasteners. Incoming wire orders still exceed output in most instances, with order backlogs extending 6 to 8 months. While pressure for delivery on larger sizes has eased, no tapering in demand is noted in the smaller size classifications. Biggest demand is for the small cold-worked items. Producers are back to normal production schedules, following curtailment of operations earlier this year as result of the industrial gas shortage.

Reinforcing Bars . . .

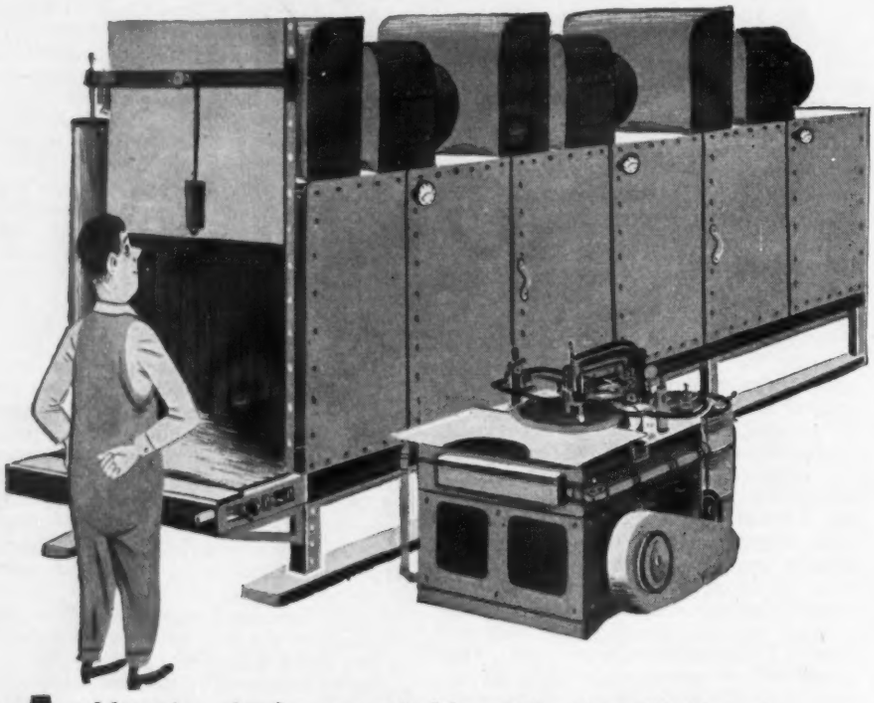
Reinforcing Bar Prices, Page 160

Pittsburgh—Leading producer has made little headway against order backlogs in recent weeks despite selective selling policy and fact output is exceeding that recorded during the closing months of last year. No let-up in demand appears in sight for the remainder of this year, particularly that tonnage originating from public works programs. Much of this type work has been delayed due to the general shortage of concrete reinforcing bars resulting from interruption to operations and general limitations placed on output because of the price-cost factor. Producers continue to book tonnage on a restricted basis, taking into consideration extent of freight absorption and customer relationships. Distribution of concrete reinforcing bars is expected to remain under strict allocation for the remainder of this year.

Chicago — Bulk of current business in reinforcing steel consists of small jobs requiring less than 100 tons. Operating under the handicap of inadequate quotas of bars from mills, fabricators prefer the small, miscellaneous work to large projects. Lower price of rerolling rails is proving of benefit to rerolling mills which had found it difficult to obtain adequate supply of rails at reasonable cost. Road construction projects are on the increase, but requirements for paving mesh are not as heavy as had been anticipated; in numerous instances, bids run higher than estimates and are either rejected or the lettings are postponed.

Seattle — Orders for reinforcing bars are mounting with increase of both public works and private construction. Bookings are mainly in small lots but the total constitutes a sizable backlog.

What a LAYOUT!



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DAREX "FLOWED-IN" COMPOUNDS MEAN BETTER STEEL PRODUCTS OF ALL KINDS

Tin Plate . . .

Approval expected for third quarter export of 140,000 tons

Tin Plate Prices, Page 161

Washington—Third quarter tinplate exports totaling 140,000 tons are expected to be approved following discussion of requirements at the meeting last week of the Tinplate Industry Advisory Committee with Civilian Administration. Of the total, 120,000 tons will be subject to rated orders on priority and 20,000 tons without priority, it was indicated after the meeting. Although controls were scheduled to terminate June 30, Congress will be asked to approve extension of control on tin and tin products beyond that date.

Transfer of control over tinplate exports is scheduled to be made to the Department of Commerce May 4, where it will be known as the Office of Materials Distribution. The branch in the department will be headed by H. B. McCoy, director, Bureau of Foreign and Domestic Commerce, according to advance indication, with Irving White as deputy director. The latter was director of the Bureau of Operations in the old CPA organization.

Lucius F. Foster, present administrative head of the Tinplate Branch, CPA, has resigned, effective May 15, to reenter trade association activities.

Pittsburgh—Despite heavy tin plate production to date this year and the relatively bright production outlook for the remainder of the year, plus substantial increase in production facilities, supply of tin plate is expected to remain well below requirements. Demand for tin plate containers is well in excess of present allocations and even should food pack requirements fail to measure up to projected volume demand for general line cans will more than take up the slack. Electrolytic tin plate specifications continue to increase, some mills reporting such business virtually matching that for hot-dipped.

Chicago — Although signs are increasing of lighter needs for tin plate for certain uses, such as bottle caps, can closures and kitchen ware, producers report overall demand as strong as ever. In fact, many consumers are pressing for increases in their allotments, but are not meeting with success. Tin mills are operating to the limit of black plate and tin supply, and despite the fact that box cars are none too plentiful, shipments are maintained closely abreast of output.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Seattle — Inquiry for cast iron pipe has slowed in the last two weeks. This is attributed to extended delivery positions, new orders being booked for delivery in late 1948 or early 1949. For this reason, many projects have been deferred.

Steel Plate . . .

Plate Prices, Page 161

Pittsburgh — Despite exceptionally large monthly output to date this year, plate producers have made little headway against order backlogs due to steady heavy volume of incoming orders for tanks, barges and similar work. Mill output continues under strict allocation. Because of this distribution pattern, it is difficult to estimate accurately current overall requirements. On the basis of present distribution pattern, mills report no openings in operating schedules through the rest of this year. Most fabricators are well behind delivery schedules due to the shortage of steel and disruption to production earlier this year resulting from scarcity of industrial gas. Some fabricators are turning down a considerable number of inquiries due to extended order backlogs and because the class of work in some instances would require an abnormal number of man hours in relation to the value of the finished job.

One of the largest purchases of river transportation equipment ever made in this country by a foreign government has been announced by Dravo Corp. The order calls for delivery to the Argentine government of one twin-screw 760 horsepower towboat, two new twin-screw pushing towboats each rated at 1000 horsepower, four new steel deck barges for hauling sand and gravel, and ten new weatherproof covered cargo barges.

Boston — Any increase in tonnage to plate fabricating shops next quarter is doubtful. Producers opening books and scheduling for third quarter are already well filled with tonnage for that period. Fabricators, therefore, are unable to place additional orders as producers continue selective in taking on new volume. Some are making slight progress against backlogs for this reason. For tank builders, weldment shops and warehouses this limits operations while smaller users are affected especially by inability to fill needs from distributors.

New York—Most plate sellers, who have been quoting on a quarterly basis, are now accepting tonnage for third quarter. However, as demand still exceeds supply, especially in light gages, they are selecting tonnage carefully. Those who are not selling on a quarterly basis are likewise selecting tonnage carefully. One mill is booked up solidly for the remainder of the year and refuses to accept business for shipment beyond.

Philadelphia — Most plate mills are stepping up operations slightly as a result of improved raw material situation, and consequently are not as badly off on their current commitments as they were. There is still more demand, however, than producers can handle and some are accepting little new tonnage until they can get their schedules in better balance. On the other hand, some producers, selling on a quarterly basis, are now accepting new specifications for the first time in about three months, having opened their books for third quarter. These sellers are not in position, however, to give customers all the tonnage desired, and in the case of light gages, nowhere near the desired tonnages.

Birmingham—A moderate tonnage of plates is being declined because of full schedules. Several key industries could operate at greater capacity were inventories in better balance. Mills have not made much progress in working off backlogs.

Seattle — Plates continue in short supply and fabricators show little interest in major projects involving large tonnages. Plants have a fair-sized backlog of contracts for tanks and boilers. Inquiry is brisk.

Structural Shapes . . .

Structural Shape Prices, Page 161

New York—Structural inquiry is a little more lively, although orders are still spotty. Several hundred tons of school work have been brought out. Approximately 700 tons are up for bids May 6 for a ventilator building on Governors Island, in connection with the Brooklyn-Battery tunnel. A New Jersey state bridge at Millville, over the Maurice river, will require about 375 tons.

Boston—Firm prices with a tendency toward elimination of the escalator clause in structural steel contracts is more apparent in quoting on private construction. Some tonnage which has been held back by escalator requirements may be released, although the mild flurry in inquiry has slackened. Delivery and completion is also a factor in the placing of some contracts; 525 tons for a worsted plant addition, Hudson, Mass., was placed on this basis rather than on lowest price. Bridge inquiry, led by 950 tons, Hampton Harbor, N. H., bids in, is light. Expected up for bids next month

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is a Connecticut river span, Greenfield, Mass. American Bridge Co., Pittsburgh, will fabricate 6000 tons for a power plant, Weymouth, Mass.

Philadelphia — While structural inquiries have been gradually accumulating, this has been due more to delay in the placing of orders than to any special upsurge in demand. In fact, new inquiry has been spotty locally for some time.

Government approval of non-housing construction in this district continues to run well in excess of denials. For the period Apr. 18-24, inclusive, for instance, 91 projects, valued at $1,655,996, were approved, against 35, valued at $445,-150, denied.

Chicago — High cost of building and bridge construction is holding back construction, but in spite of this inquiries for structural steel fabrication exceed the ability of fabricators to handle with the steel allocated to them by mills. In numerous cases jobs bid are delayed or bids rejected because cost is too high. Producers of shapes, rolling to the limit of available steel, have heavy backlogs and now are under pressure to provide structural sections for the expanding freight car building program. They fear that quotas of customers may have to be cut back somewhat during last half of the year. Inquiries for sheet piling, mainly for public jobs, are heavier.

Birmingham—Shape demand is rather spotty. Some relaxation in building plans is noted, reflecting hopes of more stabilized costs. In the case of projected construction of major nature, plans in several instances are being held in abeyance.

Seattle — Structural shape fabricators are hampered by material shortages, shipments going through shops immediately. Some plants which had fairly large inventories are now hard pressed to meet commitments. Small jobs are the rule in a majority of shops which will not accept work beyond current and anticipated material supplies. In some instances, notably forged channels, substitutions are being made.

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Pig Iron . . .

Methods sought to step up output in face of continued strong demand

Pig Iron Prices, Page 162

New York—Pig iron supply has improved, although not sufficient to meet demand at a number of consuming plants. The outlook for May for district foundries is not as encouraging as even for April, due to further sharp curtailment by the leading seaboard producer of by-product foundry coke resulting from the necessity of having to make major repairs to ovens at Swedeland, Pa. One large consumer in Schenectady N. Y. is using an increasing amount of anthracite coal to supplement his foundry coke requirements. Beehive ovens of western Pennsylvania and West Virginia are being thoroughly canvassed for tonnage and are supplying fair amounts but not nearly as much as required. On hand-drawn coke these ovens are apparently now booked tightly into the middle of June, although machine-drawn coke, can still be had for fairly nearby shipment. More and more foundries will be forced to draw on machine-drawn coke to help them out over the next few weeks at least.

Pittsburgh—Blast furnace interests predict acute shortage of pig iron through 1947. Shortage of and exorbitant prices for cast scrap have forced many foundries to seek additional pig iron allotments to sustain operations, while steel producers have been charging a greater proportion of pig iron in their open hearths to offset shortage of heavy melting steel scrap. The lone merchant pig iron producer in this district is producing 60 per cent of its customers' monthly requirements. Pig iron shortage in this area has been accentuated by the fact distribution of merchant iron here from outside districts has been all but eliminated. Further mechanization of foundries appears to be the only immediate answer toward stepping up production to meet the augmented requirements of agricultural implement and automotive industries for gray iron castings over the next few years. Casting requirements for federal housing also are expected to increase steadily through the remainder of this year.

AFL foundries in this district recently extended wage contracts for one year on the basis of 11 cents an hour increase for molders and core makers and 8 cents an hour for common labor. No agreements have yet been reached on contract extensions for CIO foundries.

Boston — With scrap prices falling, a larger ratio may be expected eventually in steel works melts and consequently less pig iron. No additional iron is in immediate sight from integrated produc-

ers, however, in view of their present high operating rates. Prospects for more tonnage in May are questionable. While more foundries are less pressed for iron, few are able to build up reserves to normal levels. This is especially true of larger consumers. Melters of basic are operating on a hand-to-mouth basis and not until additional iron is available from integrated producers or Buffalo furnaces is this situation likely to ease. Around 1250 tons, all sold, has arrived from the Netherlands.

Philadelphia — May pig iron quotas for housing work are practically the same as for April, with allotments confined to soil pipe. With all furnaces now in operation at Bethlehem, Pa., the outlook is for a somewhat better general supply in this district. The Birdsboro, Pa., producer recently shifted over from foundry to basic for a limited run. Substantial curtailment in by-product coke production by the leading seaboard producer because of necessity for making major repairs will handicap foundry operators. However, most have been able to get some beehive and are using limited supplies of by-product for "light-off" purposes, and then mixing beehive and by-product in the main fuel charge; some are also using hard coal in the mixture as well.

For the first time in months in April some foundries reported a greater volume of casting shipments than casting orders. It is still too early to properly gage significance of development.

Buffalo — Despite a large volume of order cancellations from midwest consumers, pig iron producers report demand is still running far ahead of available output. Sellers stick to this report even though some foundries also hold sizable inventories of castings. Easing the supply situation was the relighting of a fourth stack, which was withdrawn about a month ago, at the Hanna Furnace Susquehanna dock. Short coke and limestone supplies continue to hang over the market, but the condition is eased by a brisk flow of both items from the upper lakes now that the navigation season is gaining speed.

Cincinnati — An easier scrap supply has not yet been reflected in expanding foundry operations. Pig iron and coke are both in limited supply, so that the melt has been effectively held to previous levels. Allotments of iron, from both northern and southern furnaces, are expected in May in unchanged tonnage. Shipments of southern iron tend to lag, perhaps because of heavy demand for soil pipe.

Birmingham—Although at virtual capacity, pig iron output still falls considerably short of requirements. The potential needs of the district are not less than 50,000 tons a month beyond present production, according to unbiased estimates. That situation, and an identical one in steel, is holding back industrial expansion in this territory.

Seattle — The foundry situation is improved, shops reporting steady employment and good backlogs. However, the labor outlook is uncertain with unions demanding a new contract at higher levels. No more pig iron is obtainable for 60 days, but before Provo shut off supplies, local plants stocked sufficient tonnages to last them until the third quarter. Cast iron scrap is moving in larger volume and foundries are able to cover requirements. Due to the high price of pig iron, more scrap is being used.

Iron Ore . . .

Iron Ore Prices, Page 162

San Francisco — California's iron ore production in 1946 reached a total of 428,354 net tons, valued at $1,061,956, according to the state division of mines. This compared with production of 240,917 net tons valued at $883,434 in 1945.

Five mines were operated in the state last year, four in southern California and one in northern California. Two mines were located in San Bernardino county and one each in Los Angeles, Riverside and Shasta counties. Most of the ore mined in Riverside and San Bernardino counties was used by the Kaiser steel mill at Fontana. Magnetite from Shasta was used as aggregate in heavy concrete as ballast, while magnetite sands from Los Angeles went into roofing.

Lake Coal Loadings Drop Compared to 1946 Rate

Cleveland—Bituminous coal loaded into vessels at lower lake ports during the first quarter amounted to 874,031 net tons compared with 1,187,609 for the like 1946 period and 489,432 tons for the like 1945 period, according to the Ore & Coal Exchange, this city. Of this year's total, 514,659 tons were loaded in March, 159,616 tons in February, and 199,756 tons in January.

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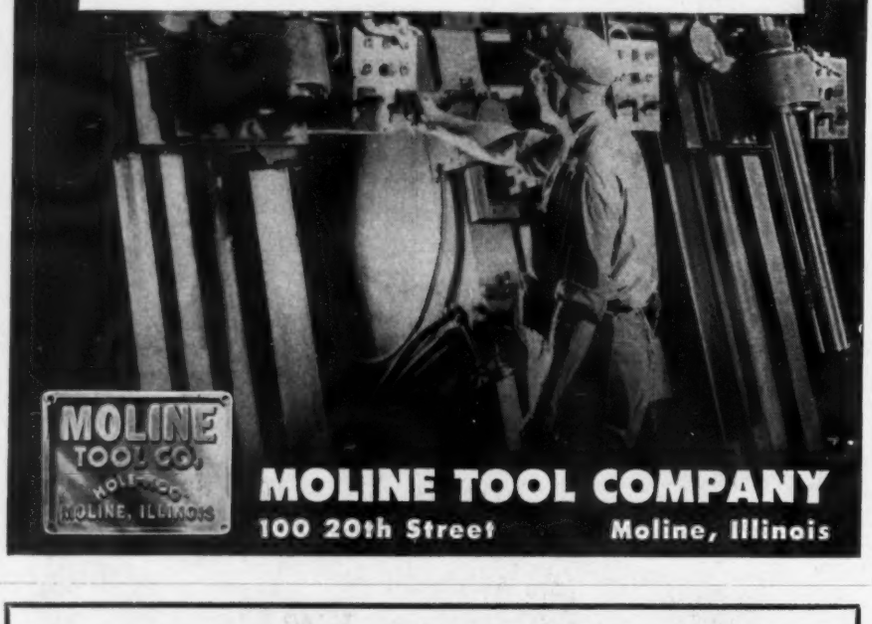

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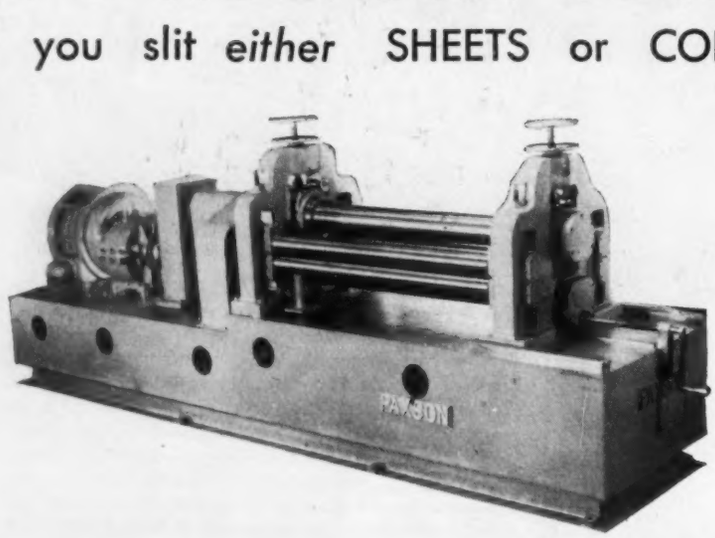

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Scrap . . .

Market continues to move lower on sale of 5000 tons at $30, Pittsburgh

Scrap Prices, Page 166

Pittsburgh — Large tonnage purchase of heavy melting steel scrap at $30 was made last week by a leading mill here, representing a price reaction of $8 per ton for local material and $16 for remote scrap from the high point reached in the recent price upsurge. It is impossible to predict at what price level the market will be stabilized for many mills still are out of the market. The larger interests claim to be slightly augmenting inventories, despite practical capacity operations, through customer channels and cleaning up old orders.

Further weakness also is noted in price for turnings, some tonnage recently being purchased around $27. One large mill has purchased low phos material from Detroit area delivered here for $35.76. Supply of cast grades is more plentiful and many foundries continue out of the market. Price level for No. 1 cupola is around $40 to $41; heavy breakable, $33 to $34. The Pennsylvania railroad list, which closes May 7, includes 6000 tons of railroad No. 1 heavy melting steel, 2000 tons of No. 1 rails, 1100 tons of angles and splice bars, 2500 tons of plate scrap, and 1800 tons of rail steel No. 3.

New York — Scrap brokers' buying prices are weak, with several major grades off $1 or more a ton. No. 1 heavy melting steel is now $25 to $26 fob shipping point; No. 2 heavy melting steel $25; No. 1 busheling, $23 to $25; and No. 1 and No. 2 bundles, $25. Machine shop turnings and mixed borings and turnings are unchanged, although short shovel turnings are easier at $20 to $21. No. 1 chemical borings also are slightly easier, now holding at $23 to $24.

No. 1 cupola cast is off slightly to $40 to $41 and charging box cast to $38 to $40. The market on unstripped motor blocks has dropped sharply to $35 to $36. Malleable continues strong and unchanged at $48 to $49. Temporarily at least low phos grades are unchanged.

With the turn of the new month, various old contracts are expiring, and new buying is expanding. As new contracts are being made at levels substantially lower than those recently expiring, the flow of scrap may taper off, as collectors will have less incentive for accumulating material.

Boston — Heavy melting steel scrap is off more than $12 a ton from the recent peak level. New contracts have been placed at $23 by Pennsylvania and district consumers. Buyers are also tightening up on specifications, making frequent rejections. Other grades of open hearth steel have weakened in ratio and the $2 differential on busheling holds. Foundry buyers are also more particular in grading and some have built up moderate reserves at higher prices. Cast has not reacted as sharply as steel scrap.

Philadelphia — A leveling off is noted in the principal steelmaking grades of scrap. Contracting is somewhat more active now that the new month is under way; however, flow of scrap is not quite so active.

No. 1 and No. 2 heavy melting steel

scrap, No. 1 busheling, and all grades of bundles, except No. 3, are unchanged. No. 3 is now holding at $25 to $26, delivered. Machine shop turnings, mixed borings and turnings, and short shovel turnings also are unchanged, but further weakness is noted in low phos scrap, with bar crops and plate, punchings and plate scrap off to a flat $34, and cut structurals down to a spread of $33 to $34. Chemical borings are down to $30 to $31, delivered.

While cupola cast is unchanged, charging box cast is lower at $39 to $40; heavy breakable at $38 to $39; unstripped motor blocks at $40; and No. 1 wheels at $44 to $45.

Buffalo—Confusion and lower prices again pervaded the scrap market last week. Prices slipped an additional 50 cents to $1.50 a ton on fresh sales. Heavy melting grades tumbled to a range of $29 to $31 a ton. Contributing to weakness here was the report that outside buyers were placing orders in the upstate region on the basis of the lower figure of the above range. Considerable improvement was shown in the flow of scrap. Cast grades joined the recession with cupola quoted at $37 to $40, off $2 to $3.

Cleveland — Further decline in scrap prices in Pittsburgh last week on a sale of 5000 tons at $30 weakened the undertone of the local market. Although mills made no new contracts for heavy melting grades, quotations were fractionally lower at $30.50 to $31. Machine shop turnings were quoted $25.50 to $26 —while mixed borings and turnings, short shovel turnings and cast iron turnings were quoted $27 to $28. Low phos material dropped to the basis of $33.50 to $34.50. Cast iron grades continued scarce and prices held fairly steady on basis of $43 to $45 for No. 1 cupola cast. Flow of material was slower as shipments on old commitments ran out and collections tapered on the price decline. Mills in this territory have scrap stocks which average slightly over 30 days' requirements.

Cincinnati—Recent sales in this and nearby districts weakened the iron and steel scrap market, which is off $2 on basis of $29 for heavy melting steel. Cast grades, which had resisted earlier cuts, also followed the trend. The market showed an upturn in activity as sellers rushed to make shipments before contracts expired. Normal needs are being filled by purchases at the new levels, in modest tonnages, but stocks have recently been built up and now are fair sized.

Chicago — The $2 per ton drop in scrap prices has failed to appreciably increase volume of sales and it may be another week before the market gets really tested. Only a few transactions have been made for open-hearth material at $31.50 delivered, lending support to the possibility that the market may be heading for still lower levels. Steel plants early last week were still receiving substantial amounts of scrap against old contracts and have been able to bolster inventories. Arrival of warm weather indicates that adequate supply will be available from this point on despite the fact that steelmaking operations now are at the highest level in almost two years.

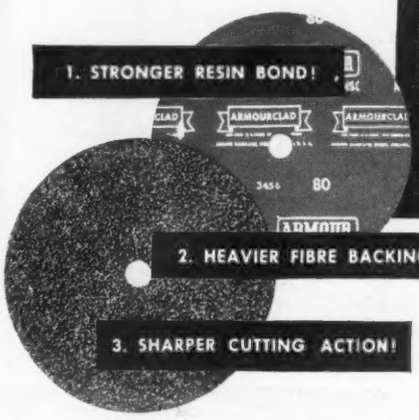
Birmingham—Scrap has eased considerably and a substantially larger movement is reported in most quarters. Major buying, however, has shown a marked decline. Dealers and consumers describe the situation as highly unsettled. Most of them believe even lower prices are in early prospect. Instances are reported here of scrap dealers offering to trade scrap for cast pipe.

Seattle — Receipts of steel scrap are satisfactory and now in excess of consumption. In consequence, inventories are being increased and the outlook is greatly improved from a month ago. Normal sources of supply are shipping increased quantities and larger output from ship breaking plants is adding materially to the total. Prices are unchanged on the basis of $27.50 for No. 1 cupola cast and $23 for stove plate.

Rails, Cars . . .

Track Material Prices, Page 161

New York—Freight car demand has been quiet recently, although the month just ended was one of the better months of the year in point of awards. An outstanding locomotive contract involves 70 units of diesel-electric motive power, both passenger and freight, for the New York Central railroad. Cost of the equipment will be $12 million, with orders being placed with the Electro-Motive Division of General Motors Corp., La Grange, Ill.; the American Locomotive Co., New York; Baldwin Locomotive Works, Eddystone, Pa.; and Fairbanks, Morse & Co., Chicago. This



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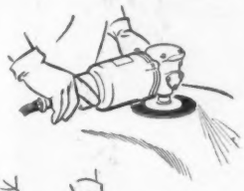

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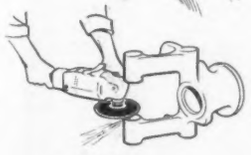

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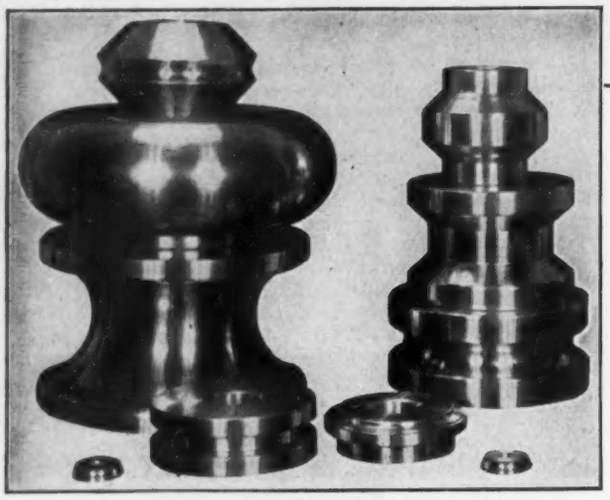

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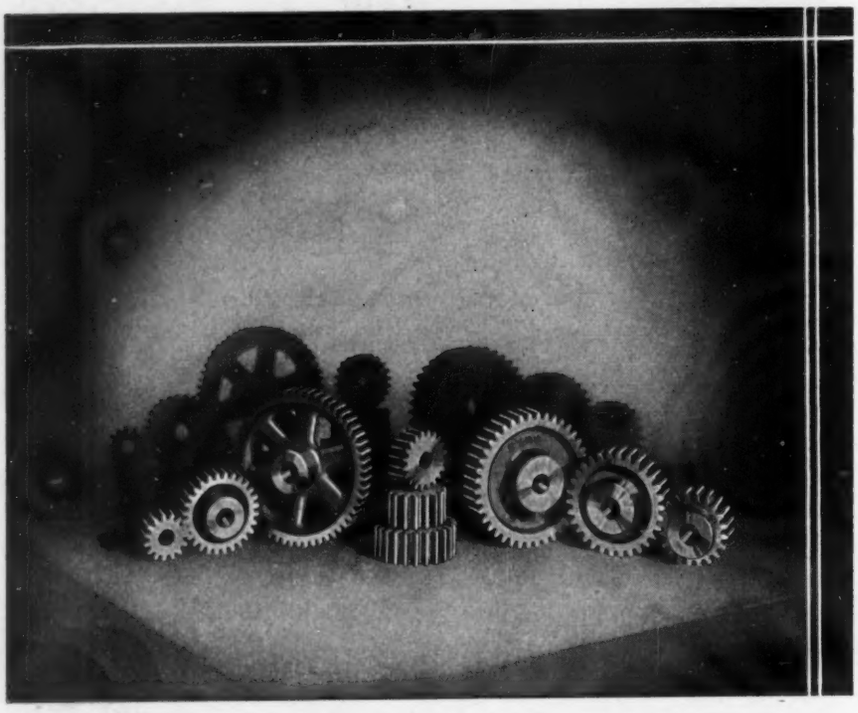

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business follows an order placed last year by the New York Central for 66 units, costing $11,100,000.

Pittsburgh—Freight car construction has recorded only slight improvement in recent weeks, with very little prospect of the 10,000-car-per-month program being reached by July. Car builders continue to hold that steel shortages are the chief bottleneck. Materials in particular short supply include: Plates, steel wheels and some structural sections. It is believed iron wheels will have to be substituted on some domestic cars this year. Producers of steel wheels, axles and other railroad specialties state their order backlogs are extended into 1948. Order backlogs of car builders also are extended into next year.

Warehouse . . .

Warehouse Prices, Page 163

Pittsburgh—Distributors' overall steel inventories continued to decline last month. However, with the steel strike threat now out of the way, warehouse interests are hopeful that continued capacity mill output will make it possible for the producers to catch up with old orders. Two distributors in this area have been assured by their suppliers that all delinquent orders will be cleared up by July. If this situation materializes, it will be the first time since the end of the war that mills have been on a current basis with warehouse accounts. One warehouse interest reports some orders placed with a mill last fall still have not been delivered. In an effort to catch up with old orders, at least one mill has reduced current warehouse allotments.

Warehouse inventories are said to be the lowest on record and extremely unbalanced in specific size ranges. Most warehouses report a dearth of light gage sheets and strip, wide flange beams and small bars; alloys and large cold-finished rounds and hot-rolled flats are in much better supply position.

Philadelphia — Warehouse billings for April were the heaviest so far this year, with jobbers looking for another banner month in May. On sheets, small carbon bars, and certain of the smaller ranges in shapes, incoming shipments from mills are still far short of consumer requirements, but in general, warehouse receipts have been heavier and sales volume has increased correspondingly. Some shape sellers assert they will be able to start off the new quarter fairly well caught up on back commitments; however, if this is the case, it is due largely to blanking out some periods in the present quarter.

Cleveland—Current reduced demand for steel products from warehouse stocks reflects unbalanced inventories in consumers' plants, jobbers report. Unable to get certain of the critically short items, which show no improvement from week to week, consumers' demands for steel products which are in better supply are easing. Careful ordering is necessary by warehouse men to prevent accumulation of too heavy inventories of the more plentiful steel items, and the same situation applies to consumers, many of whom report over-investment in inventories with impaired financial position as a result.

Cincinnati — Warehouse business is holding close to the first quarter tonnage rate, keyed as heretofore to available supplies of sheets, plates, bars and struc-

turals in which demand far exceeds supply. There has been little improvement in mill shipments.

Chicago — Warehouses are beginning to feel somewhat reduced demand for their products, either because manufacturing industry is reducing its operations or leveling off and balancing its inventories. This situation does not apply, of course, to flat-rolled products, which still are in heavy demand. Stocks of the latter are light and uneven and in view of the overall shortage of sheets and strip are not likely to be bolstered much in the immediate future. Alloys are in comfortable position, as are large-size and cold-finished carbon bars. Small bars, however, are very tight. Demand for light structurals and plates also exceeds supply.

Seattle — Warehouses report a steady volume of business, all items being in good demand. The overall situation is satisfactory. While sheets are practically unobtainable, plates, bars and shapes are reported somewhat easier. Inventories of some items are increasing. Price lists have been adjusted in accordance with change in mill prices, applying to certain items.

Semifinished Steel . . .

Semifinished Prices, Page 160

Pittsburgh — Producers of forging billets note an easing in delivery pressure within the size range of 4 to 8 inches. Despite exceptionally heavy production to date this year the overall semifinished steel supply is expected to remain well below requirements through third quarter at least. In particular short supply are wire rods, rerolling billets, blooms and slabs.

Canada . . .

Toronto, Ont.—Demand here for all lines of finished and semifinished steels far overshadows supply, despite the fact mills are maintaining near-capacity operations. While prices are unchanged from those which went into effect a year ago, there has been no withholding of steel supplies from the market.

Warehouses are unable to cope with the persistent heavy demand, many small consumers finding it almost impossible to obtain supplies. Since the turn of the year, there has been some improvement in mill deliveries, but this has not been sufficient to meet all requirements with the result that most manufacturing plants, using steel and their basic material, are operating at less than 75 per cent of capacity. Exports of steel to Great Britain have been further curtailed as government interests are directing the bulk of production into domestic channels.

Canadian steelmakers, in many instances, are endeavoring to hold down bookings to quarterly periods and in some materials are accepting orders for only about two months into the future. However, others are taking all business offered for delivery if and when supplies are available. Most consumers and warehouse operators are on a monthly quota basis and are shaping their operations along lines of supply.

Black and galvanized sheets are the most prominent on the short supply list with producers out of the market, but despite this fact inquiries continue to

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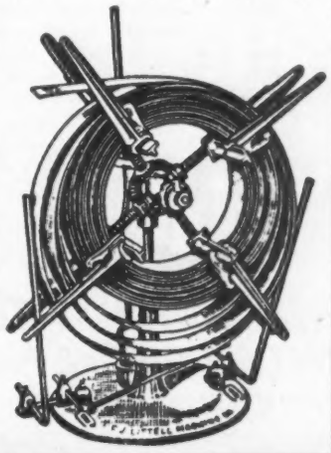

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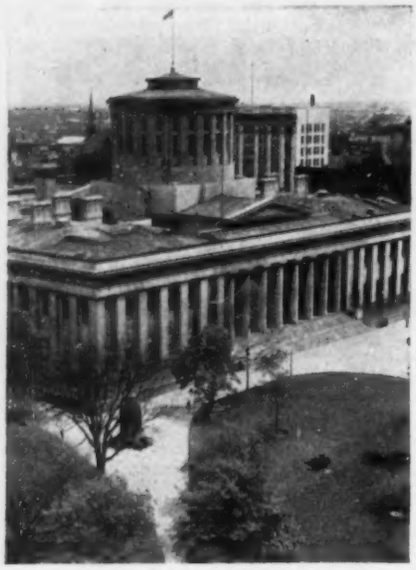

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flow in. While some barmakers are declining further carbon steel orders, others are accepting business for indefinite delivery. With practically all plate supply from domestic sources coming from Hamilton plate mills, these units are being taxed to the limit to meet urgent requirements, but are receiving some assistance by importations from the United States. While some nails are beginning to appear on the market, there is a definite shortage of 2½-inch nails, retailers having reported no supply of the latter size for several months.

Demand for merchant pig iron is steady, but with producers declining large tonnage spot orders for foundry and malleable grades sales are mostly in lots of 50 to 200 tons. While some of the larger melters have covered second quarter needs by contract, they have no protection against a price increase as prices are made known at time of shipment, a condition which also prevails with regard to all steel materials.

Continued High Zinc Demand Seen by Institute Speakers

(*Concluded from Page 72*)

Attending the meeting were 280 members of the institute, which represents the zinc industry from mining to fabricating. Officers of the group were re-elected during the 2-day session. These are: H. I. Young, American Zinc, Lead & Smelting Co., St. Louis, president; C. M. Chapin Jr., St. Joseph Lead Co., New York, R. B. Caples, Anaconda Copper Mining Co., Great Falls, Mont., and O. W. Bilharz, Bilharz Mining Co., Baxter Springs, Kans., vice presidents; R. F. Orr, Athletic Mining & Smelting Co., Ft. Smith, Ark., treasurer, and E. V. Gent, New York, executive secretary.

Directors elected or re-elected were: K. C. Brownell, American Smelting & Refining Co., New York; A. B. Marquand, U. S. Smelting, Refining & Mining Co., New York; Drew Fletcher, St. Joseph Lead Co., New York; E. R. Dondorf, National Lead Co., New York; Benno Elkan, National Zinc Co., New York; R. E. Dwyer, Anaconda Copper Mining Co., New York; Elmer Isern, Eagle-Picher Mining & Smelting Co., Miami, Okla.; E. H. Snyder, Combined Metals Reduction Co., Salt Lake City, Utah; Fred Childress, Mahutska Mining Co., Joplin, Mo.; and B. N. Zimmer, American Metal Co. Ltd., New York.

Slight Decline Reported in Industrial Truck Bookings

Domestic bookings for electric industrial trucks and tractors in February declined slightly in dollar value from that of January. Net value of chassis only was $1,051,920 in February, compared with $1,100,335 in January. February bookings consisted of 228 units, the Electric Industrial Truck Association, Chicago, reported.

Sound Government Policy Urged at C. of C. Meeting

Optimistic views of the country's economic future characterized the thirty-fifth annual meeting of the Chamber of Commerce of the United States in Washington Apr. 28-May 1.

"Our destiny," declared the keynote speaker, Earl O. Shreve, vice president of the chamber, and vice president, General Electric Co., "is to grow and to build and create new wonders. Our opportunity is to show that the American enterprise system can continue to lift the living standards of increasing millions of people at home and throughout the world."

Mr. Shreve was not deeply worried by the confusion and uncertainties attendant upon the postwar reconversion period.

"As usually happens after a war," he said, "prices have advanced rapidly during this interval. Prices, wages and costs have risen on the great flood of money created by government wartime financing. Now supply and demand are in the throes of finding new balance, through the medium of flexible prices. That always is a painful process. It calls for intelligent restraint and co-operation on the part of everybody.

"I hold the conviction that the American people are sensible enough to get through this period without repeating the experience of the bleak years following the 1929 collapse. A moderate bump, which some prefer to call a 'recession,' may accompany a readjustment in prices. We are striving for an era of plenty, and that implies a turn in prices when shortages are filled. Then the country can catch its second wind, for the long run in the race to produce and to prove the superior merits of the enterprise system."

Mr. Shreve stressed, however, the need for wise governmental policies: "We need tax cuts to stimulate investment in new enterprise, to encourage management and to ease the heavy tax burden on consumers. Lower taxes would help the country over the rough spots in the event of a business bump.

"Sound fiscal policy requires further reduction in federal spending, so far as it can be done without impairing national defense. The savings should be split between cuts in taxes and in national debt. The fruit of such fiscal policy will be increased confidence and greater inclination to venture and to expand enterprise and employment.

"The best investment that can be made in national security and foresighted action to forestall depression is to encourage job-making enterprise.

"For a decade of industrial expansion,

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"HERCULES" (Red Strand) won its place "In The Spotlight" long ago, because of its uniform reliability and economy on "heavy duty" jobs.

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Lester-Phoenix Diecasting Machine Model HP3½-X-SF. With pre-fill injection system.

LESTER-PHOENIX DIECASTING MACHINES ARE STILL PAYING OFF . . .

• A year ago LESTER-PHOENIX announced a line of really *new* Diecasting machines. And these machines—conceived and designed during the war years of yesterday—were deliberately built to meet your needs of today when reconversion has ended and the cry is again for production . . . full 24 hour, 350 day per year PRODUCTION.

• Check LESTER'S *new* diecasting machine. Note the coordinated group of major improvements, all designed to insure top production when the chips are down—and "the rent is due." LESTER machines are made in three body styles and seven capacities for zinc, tin, lead, brass, bronze and aluminum.

LESTER FEATURES FOR THE RECORD

- One piece, cast alloy steel frame.
- Toggle mechanism which transfers the ENTIRE die locking load to the frame—which can carry it without distortion.
- All machines suitable for lead, tin, zinc, aluminum, brass and bronze through the use of standard optional attachments.
- The unique "pre-fill" attachment which assures denser, tougher castings.
- Larger die height adjusting screw with area equivalent to die area assures positive die support, platen deflection.

Write Today for LESTER information and a copy of the new booklet, STEEL FOR DIE CASTING BLOCKS by L. James Erickson

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TO MARK
ANY SURFACE
that will take paint
Paintmarx
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this country will need many billions of dollars of investment in new productive facilities—in housing—in utilities and transportation—in the development of new products now germinating in research laboratories."

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

8000 tons, factory building, Caterpillar Tractor Co., Peoria, Ill., to Bethlehem Steel Co., Bethlehem, Pa.; bids Apr. 23.

6000 tons, power plant, Boston Edison Co., Weymouth, Mass., to American Bridge Co., Pittsburgh; Jackson & Moreland, Boston, engineers.

500 tons, addition to administration building and auditorium, Armstrong Cork Co., Lancaster, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

390 tons, enameling shop, John A. Roebling's Sons Co., Trenton, N. J., to unnamed fabricator.

320 tons, reconstruction of the Barge Canal dyke at Bushnell Basin, Rochester, N. Y., to the Bethlehem Steel Co., Bethlehem, Pa; McLain Construction Corp., Buffalo, contractor.

134 tons, building, Acme Steel Co., Riverdale, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.; LaSalle Construction Co., Chicago, contractor.

Unstated, Oregonian newspaper plant, Portland, Oreg., to Gunderson Bros. Engineering Corp., Portland.

STRUCTURAL STEEL PENDING

2200 tons, power plant, unit No. 4, Port Washington, Wis.

1300 tons, five bridges, Puyallup river, Washington; bids to U. S. engineer, Seattle, postponed from Apr. 30 to May 13.

950 tons, plant addition, A. G. Spaulding & Bros. Inc., Chicopee, Mass.; J. W. Harris Associates Inc., New York, engineers.

700 tons, ventilator building, Governors Island, bids May 6. This is in connection with the Brooklyn-Battery project.

375 tons approximately, state bridge, over Maurice river at Millville, N. J., bids asked.

285 tons, rotogravure plant, R. Donnelley-Crawfordsville Co., Chicago; bids April 30.

225 tons, factory, Anton Machine Co., Queens, New York, bids asked.

203 tons, highway bridge FI-142(17), Winnebago county, Ill., for state; bids Mar. 28 rejected; new bids May 2.

150 tons, warehouse, Pennsylvania Sugar Refining Co., Philadelphia; bids asked.

150 tons, miscellaneous support steel, American Viscose Co., Parkersburg, W. Va.; pending.

150 tons, state bridge, Luzerne county, Pennsylvania, bids May 9.

130 tons, McCrorey store addition, Philadelphia; pending.

120 tons, state bridge, Cambria county, Pennsylvania; A. E. O'Block, Unity, Pa., awarded general contract.

105 tons, addition, Esslinger brewery, Philadelphia; pending.

60 tons or more, transmission towers, Snohomish, Wash., bids to Bonneville Power Administration, Portland, Oreg., Apr. 30.

Unstated, Public School No. 174, New York city, bids asked.

Unstated, addition, School No. 131, New York city, bids May 13.

Unstated, addition, School No. 105, New York city, bids May 6.

REINFORCING BARS . . .

REINFORCING BARS PLACED

510 tons, Davis dam, Bureau of Reclamation, Denver, to Capitol Steel & Iron Co., Oklahoma City, Okla.; $51,810.

150 tons, two grain elevators in eastern Oregon and Idaho, to Bethlehem Pacific Coast Steel Co., Seattle.

Unstated, Oregonian newspaper plant, Portland, Oreg., to Mercer Steel Co., Portland.

REINFORCING BARS PENDING

600 tons, tunnel and siphon, Columbia Basin project; bids to Bureau of Reclamation, Denver, Apr. 30.

500 tons, $600,000 library building, University of Washington, Seattle; bids to Board of Regents, May 20.

215 tons, Washington state concrete girder bridges, Walla Walla county, bids to Olympia, May 13.

175 tons, state bridge, Newark, Del.

120 tons, Elks Temple, Bremerton, Wash., Dan Solie, Bremerton, low on general contract, $369,043.

110 tons, bridge, Bureau of Roads, Lewis county, Washington; bids to Portland, Oreg., May 13.

100 tons, Yakima river bridge, Yakima county, Washington; bids to commissioners, Yakima, May 14.

Unstated, Oregon highway, Multnomah county bridge; G. F. Atkinson Co., San Francisco, low $317,400.

Unstated, Fibreboards Products Inc. plant, Portland, Oreg.; bids soon.

Unstated, roofing products plant for Flintkote Corp., Portland; general contract to Waale-Camplan Co., Portland.

PLATES . . .

PLATES PLACED

200 tons or more, including shapes, 180-foot Columbia river ferry, to Albina Engine & Machine Works, Portland, Oreg., low, $430,223.

116 tons, bins, Lloyd A. Fry Roofing Co., Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

PLATES PENDING

1500 tons, tank work, Socony Vacuum Oil Co., Paulsboro, N. J.

Unstated tonnage, 72-inch outlet pipes, Colorado-Big Thompson project, Bureau of Reclamation, Denver, Thompson Pipe & Steel Co., Denver, $55,270 fob shipping point, low.

PIPE . . .

STEEL PIPE PENDING

Unstated, 19,000 feet, 8 and 16-inch water pipe, for Bow Lake airport system; bids to Port of Seattle, May 2.

Unstated, 4370 feet, 6 to 12-inch steel pipe and fittings; bids to Moses Lake, Wash., May 9.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Bangor & Aroostook, twelve 1500-horsepower diesel electric locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

New York Central, 70 diesel-electric units, both passenger and freight, to Electro-Motive Division of General Motors Corp., La Grange, Ill.; the American Locomotive Co., New York; Baldwin Locomotive Works, Eddystone, Pa.; and Fairbanks-Morse & Co., Chicago.

LOCOMOTIVES PENDING

St. Louis-San Francisco, 46 diesel-electric road and switching units, purchase authorized by directors; estimated cost, $5,719,000.

RAILROAD CARS PLACED

Detroit & Mackinac, 25 fifty-ton hopper cars and 10 seventy-ton covered hoppers, to General American Transportation Corp., Chicago.

RAILROAD CARS PENDING

Union Pacific, 400 seventy-ton hopper cars.

RAILS PLACED

Maine Central, 2578 tons of rail, to Bethlehem Steel Co., Bethlehem, Pa.

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AND ENGINEERING
EQUIPMENT

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LANSDOWNE, Del. Co., PENNA.

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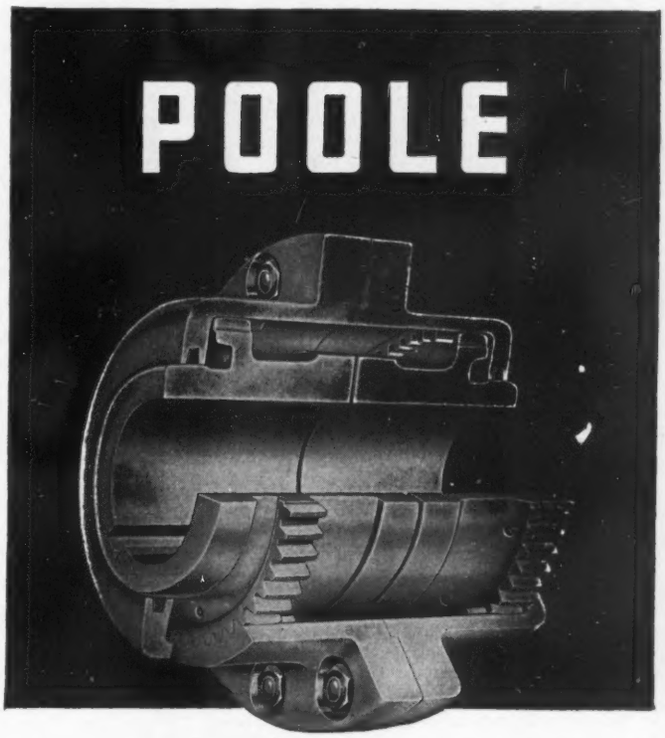

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Southern Natural Gas Co. will spend $50 million for a construction program which will include expanding the system's capacity and making extensions.

ALASKA

ANCHORAGE, ALASKA—City plans to extend its water, sewer and power distribution facilities.

ARKANSAS

LITTLE ROCK, ARK.—Westinghouse Electric Corp. has CPA approval for construction of a factory building for manufacture of tungsten filament lamps. Cost will be $808,604.

CALIFORNIA

EL CENTRO, CALIF.—Edgar-Purdy Co. has been formed by B. R. Purdy with a capital of $75,000 to manufacture and sell farm and industrial machinery.

EMERYVILLE, CALIF.—Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago, has awarded a $490,000 contract to Louis C. Dunn, Monadnock Bldg., San Francisco, for an office and warehouse building at 65th and Hollis Sts.

JACKSON, CALIF.—Pacific Gas & Electric Co., 245 Market St., San Francisco, will soon let a $15,600,000 contract for an electric power house and related structures on Mokelumne River near here.

LOS ANGELES—De Luxe Industries Inc. has been formed by Joseph S. Cannon with a capital of $200,000 to manufacture tools, dies, jigs and fixtures.

LOS ANGELES—Musselman Corp. has been formed by Alvin J. Musselman, 15 W. Carrillo St., Santa Barbara, to manufacture appliances and tools.

LOS ANGELES—Trailmobile Co., 1765 E. 46th St., has CPA approval for construction of two extensions, 80 x 92 ft and 42 x 146 ft, which will cost $57,600.

LOS ANGELES—K. H. Davis Wire & Cable Corp., 2260 Santa Fe Ave., is having plans revised by Pierpont Davis, 3215 W. 6th St., for a proposed factory, 133 x 91 ft.

LOS ANGELES—Talley Machine & Mfg. Corp. has been formed by Frank Talley with 7500 shares of no par value capital stock. Firm is represented by Owen A. Bartlett, 1118 Transamerica Bldg.

LOS ANGELES—Cutcret Corp. has been formed by William H. Lewis and associates with a capital of $100,000 to manufacture and sell road building machinery. Firm is represented by J. M. A. Westermore, 9405 Brighton Way, Beverly Hills, Calif.

OAKLAND, CALIF.—John Morrell & Co. has received CPA approval for construction of a $400,000 metal processing plant.

RIVERSIDE, CALIF.—Braman-Dickerson Co. Inc. has been formed by F. A. Braman and associates with a capital of $500,000 to manufacture and distribute farm and industrial tools.

SAN DIEGO, CALIF.—Cordrey Mfg. Co. has been incorporated by Hancil Cordrey with a capital of $500,000 to manufacture and deal in builders' hardware, hardware specialties and toys. Firm is represented by F. B. Nottbusch, 1230 Bank of America Bldg.

SAN FRANCISCO—Kortick Mfg. Co. has been incorporated by Easton G. Hacker and associates with a capital of $500,000 to manufacture pole line hardware, nuts and bolts. Firm is represented by Frank I. Ford, 156 Montgomery St.

SAN JOSE, CALIF.—Welsch Forge Inc. has been formed by Frank J. Welsch with a capital of $50,000 to manufacture steel and metal products of all kinds. Firm is represented by Harvey S. Miller, First National Bank Bldg.

SANTA ANA, CALIF.—Orange Country Machine Works has been incorporated by J. C. Coombs with a capital of $75,000 to manufacture and sell high pressure tanks.

SANTA MONICA, CALIF.—Douglas Aircraft Co., 3000 Ocean Park Blvd., has received CPA approval for construction of a $50,000 engine test building, 27 x 112 ft.

DELAWARE

NEWARK, DEL.—Chrysler Corp., Detroit, has named Albert Kahn Associated Architects & Engineers Inc., Detroit, to build a 1- and 2-story warehouse and office, 1082 x 600 ft. Cost will be $1,930,000.

GEORGIA

COLUMBUS, GA.—Morton Machine Works Inc. has let a contract to Murphey Pound Construction Co. for a plant addition. Architect is Wilbur D. Talley.

ILLINOIS

DANVILLE, ILL.—Mercer Foundry & Mfg. Co., 24½ N. Vermilion, suffered $200,000 damages from fire recently.

INDIANA

FORT WAYNE, IND.—Allen Steel Co. Inc., 502 S. Calhoun St., has been formed to manufacture steel products by Frederick Moesser and associates.

LOGANSPORT, IND.—Handi Foundries Inc., 1119 N. Magnolia St., has been formed as a general foundry business by Harry J. Dice.

MARION, IND.—Anaconda Wire & Cable Co. will build a $116,000 addition to its No. 3 plant. It will be 120 x 140 ft and one story high.

MARYLAND

BALTIMORE—General Refractories Inc. has completed plans for two oil-fired kilns to cost $20,000. Owner will build.

MICHIGAN

WARREN TOWNSHIP, MICH.—Falls Spring & Wire Co., Detroit, is having plans completed by Christian W. Brandt, Royal Oak, for construction of a $275,000 addition to its plant on East Nine-Mile Rd.

YPSILANTI, MICH.—Ford Motor Co. has CPA approval for construction of a plant which will cost $830,236.

MISSOURI

ST. LOUIS—National Bearing Division of American Brake Shoe Co., 4934 Manchester, has awarded contract to Jones-Kissner Construction Co., 722 Chestnut St., for construction of 1-story addition. Engineer is Neal J. Campbell, 911 Locust St.

NEW YORK

BUFFALO—Tripp Plating Works has been incorporated by John Petock with a capital of $100,000.

NORTH CAROLINA

GREENSBORO, N. C.—City has voted a $245,000 sanitary sewer improvement bond.

OHIO

CLEVELAND—Fanner Mfg. Co., Brookside Park, will build a 2-story addition at a cost of $339,000.

CLEVELAND—Locomotor Corp., 1196 E. 152nd St., plans plant alterations which will cost $55,000.

CLEVELAND—Mutual Metal Products Inc. has been formed by Rudolph J. Pepke, 17600 Waterloo Rd., with a capital of $50,000 to manufacture metal products and hardware.

WARREN, O.—Packard Electric Division, General Motors Corp., 305-541 Dana NE, will build a 545 x 320 ft factory on a recently acquired site on Thomas Rd.

WHITE ROCK, O.—Kelley Island Lime & Transport Co. has named Ferguson Co. to design, build and equip a finishing lime plant here and to modernize quarry facilities at Gibsonburg, O. Cost will be approximately $800,000.

OKLAHOMA

OKMULGEE, OKLA.—East Central Oklahoma Electric Co-operative Inc., has REA funds of $121,000 for completion of construction work and for 63 miles of line.

VINITA, OKLA.—Northeast Oklahoma Electric Co-operative Inc. has REA funds of $303,000 for system improvements and 116 miles of line.

OREGON

PORTLAND, OREG.—Board of Higher Education has called bids May 13 for five-ton traveling crane for Oregon State College.

PENNSYLVANIA

PHILADELPHIA—Philadelphia Electric Co., 900 Sansom St., plan to build a $123,000 substation.

TEXAS

AZLE, TEX.—Tri-County Electric Co-operative Inc. has REA funds of $370,000 for 318 miles of line.

COMANCHE, TEX.—Comanche Electric Co-operative Association has REA funds of $335,000 for system improvements and 268 miles of line.

DENISON, TEX.—Chicago Bridge & Iron Co., Tulsa, Okla., was successful bidder on penstock and surge tank steel for Denison dam five miles from here on Red River. Westinghouse Electric Corp. will manufacture a 35,000 kw generator for the project. S. Morgan Smith Co., York, Pa., has been awarded the contract for a turbine.

EL PASO, TEX.—Fruehauf Trailer Co., A. V. Tice, resident engineer, has acquired a site and contemplates building a factory to cost about $125,000.

HEBBRONVILLE, TEX.—Sun Oil Co., M. Esperson Bldg., Houston, plans to build a $260,000 pressure maintenance plant here and a similar facility costing $210,000 at Roma.

MART, TEX.—Limestone County Electric Co-operative has REA funds of $350,000 for system improvements and 260 miles of line.

MEMPHIS, TEX.—Hall County Electric Co-operative Inc. has REA funds of $125,000 for 108 miles of line.

PORT ARTHUR, TEX.—Gulf Oil Refining Co., c/o C. R. Stevenson, has abandoned its $200,000 project for a boiler and tin shop.

WASHINGTON

DAVENPORT, WASH.—Lincoln County Electric Co-operative has awarded a $94,000 contract to Agutter Electric Co., Seattle, for construction of 180 miles of line.

CANADA

TORONTO, ONT.—Canadian Hanson & Van Winkle Co. Ltd., machinery manufacturer, plans construction of plant addition on Morrow Ave. estimated to cost $60,000.

MONTREAL, QUE.—United Shoe Machinery Co. of Canada Ltd., 2610 Bennett St., has awarded contract to Foundation Co. of Canada Ltd., 1900 Sherbrooke St. W., for a plant addition to cost about $140,000.

MONTREAL, QUE.—International Harvester Co. of Canada Ltd., Hamilton, Ont., has awarded contract to Corinthian Construction Co. Ltd., 5726 Sherbrooke St. W., for a plant here to cost about $350,000.

MORANDA, QUE.—MacDonald Mines Ltd., 1085 Beaver Hall Hill, Montreal, plans installation of mining plant and equipment here estimated to cost $2 million.

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The Original Oil Hardening, Non-Deforming High Carbon-High Chrome Steel

Outstanding in its class! Your best steel for mass production dies. Possesses high resistance to abrasion, non-deforming, uniform hardness penetration to center of tool. Keeps a keen edge longer than most other tool steels. Ideal for slitting cutters.

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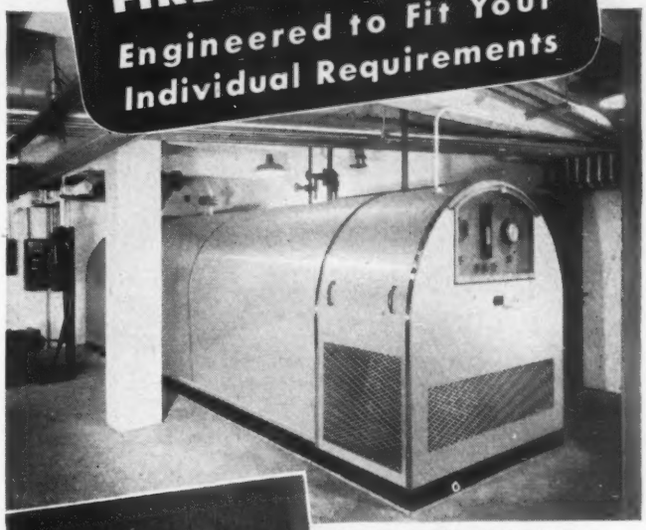
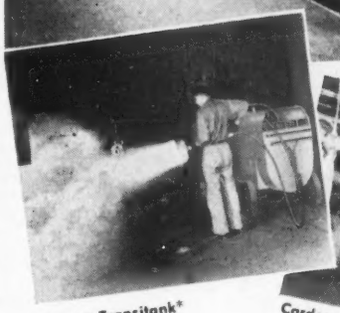
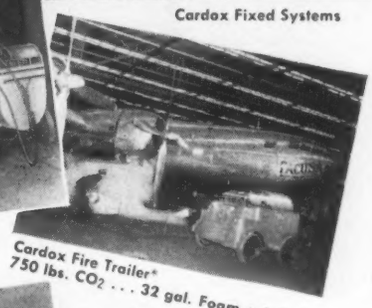


Cardox Fixed Systems

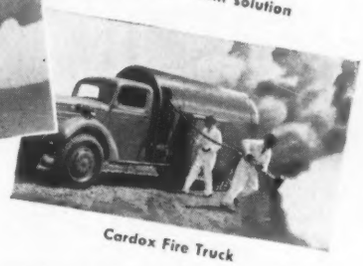


Cardox Transitank*
750 lbs. CO_2



Cardox Fire Trailer*
750 lbs. CO_2 . . . 32 gal. Foam solution

Cardox Airport Fire Truck



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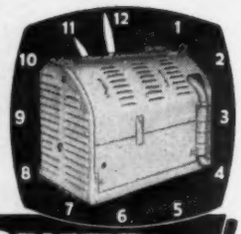

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Hand Operated Weight 70 lbs.
Capacity 3/16" hole through 1/4" metal

•

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Present Range of Front Lever Punches and Dies

Round 1/16" to 1/2" by 1/64ths. and No. 30, No. 24, and No. 19 Drill Size

Flat	Regular Oval	Semi-Circular End Oval		Square	
3/8" x 1/4"	1/2" x 5/16"	1/2" x 5/16"	11/32" x 9/32"	3/8"	17/64"
5/16" x 1/4"	1/2" x 9/32"	1/2" x 9/32"	11/32" x 7/32"	11/32"	1/4"
5/16" x 3/16"	1/2" x 3/16"	1/2" x 7/32"	5/16" x 1/4"	21/64"	7/32"
1/4" x 3/16"	1/2" x 5/32"	1/2" x 3/16"	5/16" x 9/64"	5/16"	3/16"
	13/32" x 9/32"	1/2" x 5/32"	9/32" x 7/32"	9/32"	5/32"
					9/64"

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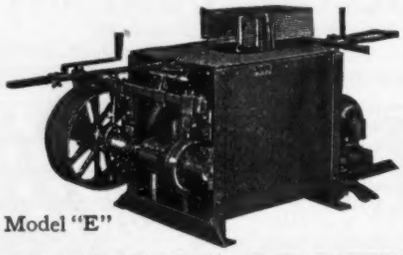
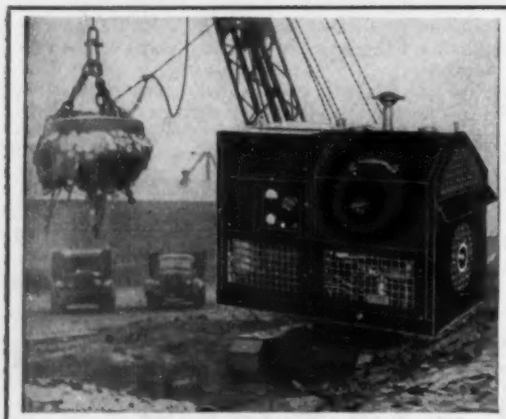


Model "E"

KARDONG BROTHERS, INC.
MINNEAPOLIS, MINN.



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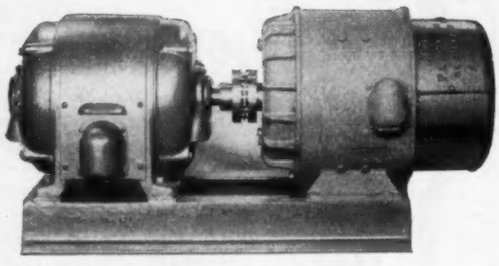

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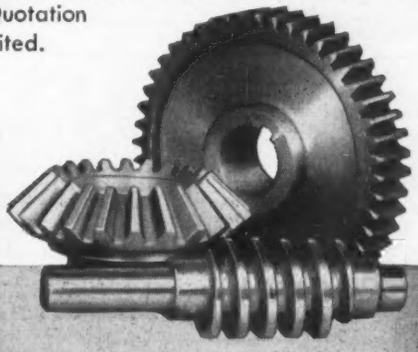

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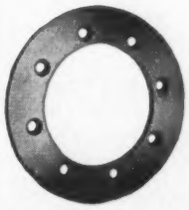

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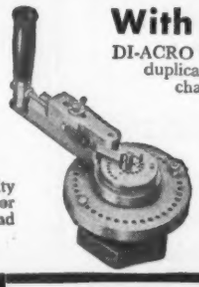

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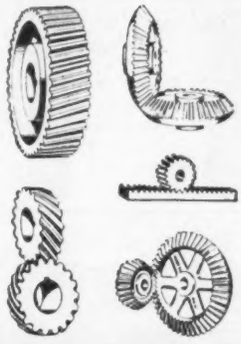

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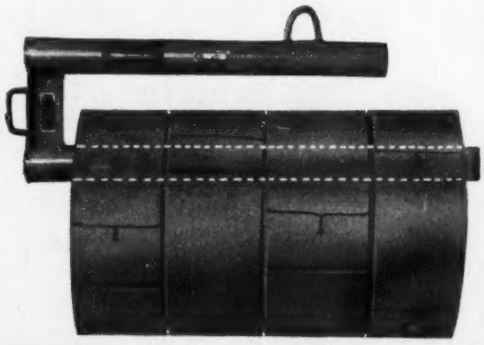

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FOREMAN AND STAFF SPECIALIST, 16 years manufacturing experience invites correspondence. Want work in dry climate, prefer small community. Age 37. Write Box 950, STEEL, Penton Bldg., Cleveland 13, O.

CLASSIFIED

Help Wanted

CHIEF ENGINEER

Wanted

Experienced on design and development of mechanical power presses who can supervise and direct the work of others on such work and on other sheet metal working machinery. Reply by letter only stating complete details of experience, places of employment, education, any special qualifications, and salary expected. Your reply will be held confidential.

Niagara Machine & Tool Works
683 Northland Ave. Buffalo, N. Y.

SALES MANAGER

With successful sales record by one of the leading manufacturers in the metal cutting tool industry. State age, education, experience, special qualifications and compensation desired. Address Box 952, STEEL, Penton Bldg., Cleveland 13, O.

Accounts Wanted

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Have established office, experienced personnel having contacts with large and small industrial concerns, financially responsible. Seeking mechanical items on exclusive commission basis.

Address Box 965,
STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

Wanted MASTER MECHANIC

Man with good engineering background, experienced in electrical and mechanical maintenance and installation to serve as Master Mechanic in six operating plants. The man we want must have a good background of leadership and capable to organize and direct all maintenance work. Must have experience in maintenance of overhead cranes, foundry molding units, conveyors, and machine tool equipment. Write fully giving particulars as to age, education, previous work experience and salary desired. Address Box 954, STEEL, Penton Bldg., Cleveland 13, O.

SALES PROMOTION

Aggressive technical graduate under 30 interested in promotional and industrial sales. No experience required. Permanent position with long established corporation located in Cleveland. State age, education, qualifications and salary expected.

Address Box 944,
STEEL, Penton Bldg., Cleveland 13, O.

WANTED—SHOP MANAGER. WELL ESTABlished company in Ohio engaged in the manufacture of dies and stampings requires a man with a successful background. Must be a live wire and have initiative. Knowledge of modern shop practice, estimating, designing and production is essential. Give complete details in your letter and salary desired. Address Box 956, STEEL, Penton Bldg., Cleveland 13, O.

MANAGEMENT ENGINEER AND DIE DEsigner. Medium sized Eastern Drop Forging Plant requires services of engineer with at least ten years forging plant management experience and drop forging die designing. Give full exnerience and salary requirements in first letter. Excellent opportunity. Address Box 957, STEEL, Penton Bldg., Cleveland 13, O.

STRUCTURAL STEEL DESIGNER AND Estimator wanted by a leading structural fabricator with large industrial clientele located in central west. Permanent position and good opportunity. State qualifications, past experience and salary expected. Address Box 958, STEEL, Penton Bldg., Cleveland 13, O.

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Available to

FOUNDRIES AND MANUFACTURERS IN MIDDLE WEST

Materials which can be X-Rayed include magnesium, aluminum, iron, steel, copper, brass and bronze.

Size:	From ⅛" to 6" in thickness—all sizes of units up to 12' in length. Door opening 12' high, 10.5' wide, 6' clearance above door for positioning of tube head.
Structure:	Castings, welds and welded structures, high pressure vessels, and boilers.
Equipment:	(a) 220,000 volt unit for light alloys and thin steel sections. (b) 1,000,000 volt unit for medium and heavy sections.
Prices:	Based on time, equipment, and type of work to be done.

Address: Laboratory Division
AUTO SPECIALTIES MFG. COMPANY
St. Joseph, Michigan

Representatives Wanted

WANTED: MANUFACTURERS' REPRESENTatives calling on various Industrial and Fabricating Plants to handle a Coiled Spring and Wire product account. All territories open. Straight commission. Address Box 959, STEEL, Penton Bldg., Cleveland 13, O.

SPECIAL MANUFACTURERS TO INDUSTRY...*Since 1905*

Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials

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OR PARTS AND DEVELOPMENT ONLY

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Viking High Speed Tool Bits
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AGERSTRAND CORPORATION
Muskegon, Michigan

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SALKOVER METAL PROCESSING
321 Dixie Terminal Cincinnati 2, Ohio

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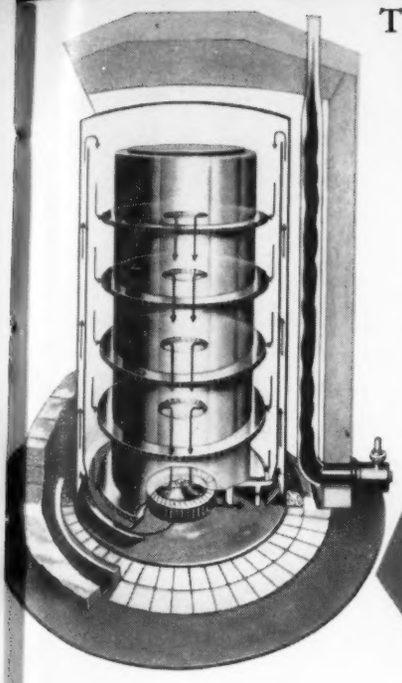
THE

WILSON RADIANT CONVECTOR BELL TYPE ANNEALING *Furnaces*



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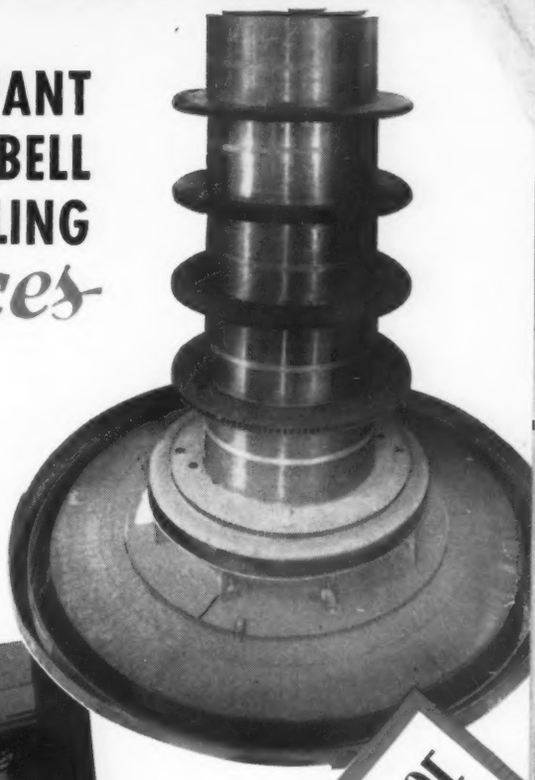

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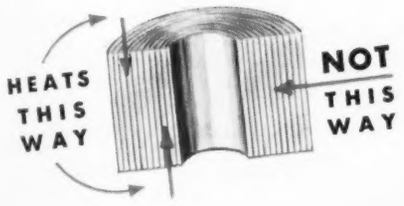

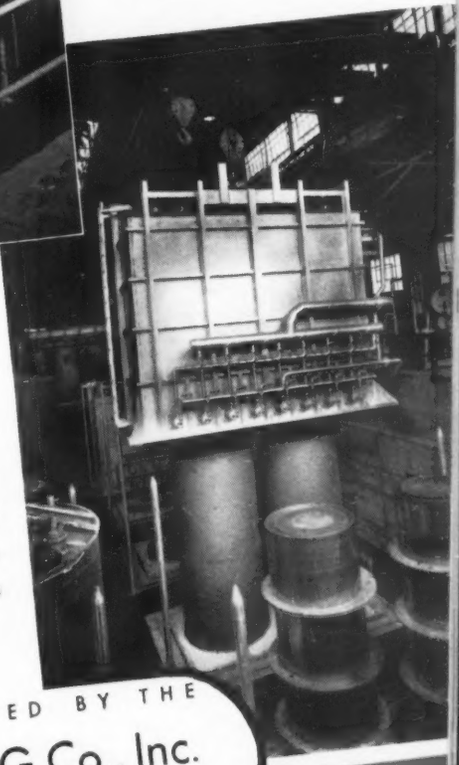

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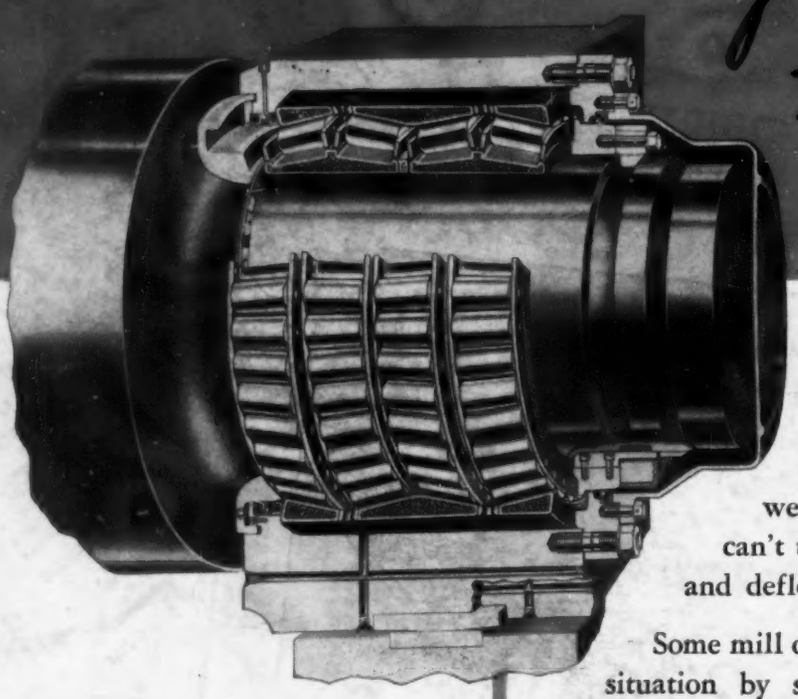
Telephone ACademy 4670

Sold by The WEAN ENGINEERING CO., Inc., Warren, Ohio

INDUSTRIAL FURNACES ★ RADIANT TUBE HEATING ★ HEAT TREATING PROCESSES

Are your rolling mills "Getting it in the Neck?"



Today's super rolling speeds and pressures play havoc with weak mill roll necks; they simply can't take the increased neck stresses and deflection.

Some mill operators have tried to meet the situation by sacrificing the efficiency and economy of roller bearings in order to increase roll neck diameters. That's only robbing Peter to pay Paul, however.

Here's how to stop it— And still have roller bearing efficiency . .

The right way — the profitable way is to equip your mills with Timken Balanced Proportion Roll Neck Bearings; then you can have roll necks big enough and strong enough to resist any and every operating load imposed on them and, at the same time the simplicity, efficiency and economy so long associated with roller bearings.

For further information consult the mill builder or our roll neck bearing engineers. The Timken Roller Bearing Company, Canton 6, Ohio.

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